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Government of India
National Centre for Disease Control
Directorate General of Health Services
Ministry of Health and Family Welfare

Date:-11-09-2020

(Office Memorandum)

Sub: Invitation for Public Comments on Draft National Action Plan for Eliminating Dog Mediated Rabies from India

National Center for Disease Control (NCDC) the nodal agency, for implementing National Rabies Control Program has drafted a "National Action Plan for Eliminating Dog Mediated Rabies from India (NAP-RE)" with a "One Health" approach.

2. Public comments are hereby solicited on the Draft NAPRE. The draft is available at the link <https://www.ncdc.gov.in/index1.php?lang=1&level=1&sublinkid=146&lid=1>.

3. Stakeholders are requested to send their comments by **EMAIL ONLY** at napreindia@gmail.com by end of business hours of **25th September 2020**.

This issues with the approval of Director, NCDC

-sd/
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(Directorate General of Health Services)
Ministry of Health & Family Welfare
Government of India

National Action Plan
for Eliminating
Dog Mediated Rabies from India



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Abbreviations

DALYs	Disability-adjusted life years
GIA	Grant in aid
ABC-AR	Animal Birth Control- Anti Rabies
CABC	Community-based Animal Birth Control
CNS	Central nervous system
DAHD	Department of Animal husbandry and dairying
FAO	Food and Agriculture Organization
IEC	Information, Education and Communication
NGO	Non-governmental organization
OIE	Office International des Epizootic (World Organization for Animal Health)
SOP	Standard Operating Procedure
SAARC	South Asian Association for Regional Cooperation
MDV	Mass dog vaccination
DPM	Dog population management
PEP	Post-exposure prophylaxis
HRIG	Human Rabies Immunoglobulins
ID	Intradermal
IDRV	Intradermal Rabies Vaccination
IM	Intramuscular
IU	International Units
ARC	Anti -Rabies Clinic
CSF	CerebrospinalFluid
ELISA	Enzyme-Linked Immunosorbent Assay
RFFIT	Rapid Fluorescent Focus Inhibition Test
FAT	Direct Fluorescent AntibodyTest
DRIT	Direct Rapid Immune HistochemicalTest
RT-PCR	Reverse Transcription Polymerase Chain Reaction
MoHFW	Ministry Of Health &Family Welfare
MoFAHD	Ministry Of Fishery, Animal Husbandry &Dairying
MoAFW	Ministry Of Agriculture And Farmers Welfare,
MoHUA	Ministry Of Housing &Urban Affairs
NHRC	National Human Rights Commission
DCGI	Drug Control General of India
MoPR	Ministry of Panchyati Raj
MoHRD	Ministry of Human resources development,
MoST	Ministry of science and technology
NCDC	National Centre for Disease Control
IDSP	Integrated disease surveillance programe
NIMHANS	National Institute of Mental Health & Neurosciences
ICMR	Indian council of medical research
ICAR	Indian council of agriculture research
VRDL	Virus Research Diagnostic Laboratory

ABOUT THE DOCUMENT

Rabies is one of the most fatal zoonotic diseases which has tormented the humans since antiquity. It is transmitted after bite of rabid animal, and is 100 % fatal if the timely intervention in terms of appropriate management of wound and Anti Rabies Prophylaxis is not given to the animal bite victims. About 96% of the mortality and morbidity is associated with dog bites.

Effective prevention and control of Rabies could be achieved by concerted efforts by all stakeholders by adopting "One Health Approach". The Ministry of Health has already rolled out National Rabies Control Program in 12th FYP.

The Department of Animal Husbandry&Dairying, Ministry of Fisheries AH & Dairying, GOI is also supporting State Governments for canine vaccination under ASCAD Scheme. Apart from this State Governments have funds earmarked in Municipalities for ABC programs and dog vaccination.

This “National Action Plan” for Rabies Elimination in India has been developed with inputs by experts from stakeholders. The National Action Plan for Rabies Elimination (dog mediated) in India provides a broad framework for combating Rabies. The NAP-RE is a guidance document for the states/ stakeholders to develop their own action plan, specific to their needs and aims at systematic reduction of rabies risk through sustained mass dog vaccinations, pre and post-exposure prophylaxis and public education until the country is completely free of dog-mediated rabies. This document will help in the following:-

- 1.** To prepare an action plan that centres on the elimination of human rabies transmitted by dogs,
- 2.** To Strengthen State’s commitment on implementation of NAP-RE
- 3.** To ensure, for as long as possible, continuity of prevention of human rabies with effective, quality assured and vaccinations accessible to all who need them
- 4.** To strengthen capacities of the public Health Services, Veterinary Services and the local governing bodies.
- 5.** To Identify and support activities that when strategically used would eliminate dog mediated rabies.
- 6.** To strengthen Inter-ministerial, Inter-department coordination and supporting mechanisms among all stakeholders
- 7.** To obtain and sustain high-level political commitment at the central and state level.
- 8.** To encourage community participation in urban and rural areas.

Chapter 1 Epidemiology of Rabies

Introduction

Rabies is an acute viral disease that causes fatal encephalomyelitis in virtually all the warm-blooded animals including man. The virus is found in wild and some domestic animals and is transmitted to other animals and to humans through their saliva (following bites, scratches, licks on broken skin and mucous membrane). In India, dogs are responsible for about 97% of human rabies, followed by cats (2%), jackals, mongoose and others (1%). The disease is mainly transmitted by the bite of a rabid dog.

Rabies has terrified man since antiquity. The fear is by no means unfounded since the disease is invariably fatal and perhaps the most painful and dreadful of all communicable diseases in which the sick person is tormented at the same time with thirst and fear of water (hydrophobia). Fortunately, development of rabies can be prevented to a large extent if animal bites are managed appropriately and in time. Effective vaccines are available both in Human and Veterinary sectors. Rabies is a classic example which needs to be addressed through concerted and coordinated efforts between health and veterinary sector by One Health Approach.

Magnitude of the Problem

Global

The number of human deaths globally due to dog-mediated rabies is estimated to be 59 000 annually, with an associated loss of 3.7 million DALYs. The majority of deaths are estimated to have occurred in Asia (59.6%) and Africa (36.4%). The overall economic cost of dog-mediated rabies was estimated to be US\$ 8.6 billion. An enhanced verbal autopsy survey within the Million Deaths Study suggested that 12700 deaths were due to furious rabies in India.

India

In India, rabies is transmitted commonly by dogs and cats (~97%), followed by wild animals (2%) such as mongoose, foxes, jackals, and wild dogs, and occasionally by horses, donkeys, monkeys, cows, goats, sheep, and pigs. Rodents, rats and bandicoots, squirrel, rabbits, birds, and bats are generally not known to transmit rabies. The presence of unvaccinated free-roaming dogs (FRD) or street dogs, amidst human settlements is a major contributor to the high incidence of rabies in India, as the disease is endemic. Hence estimating such street dog's population size is crucial to the planning and evaluation of any interventions, such as mass immunization against rabies. Apart from human, rabies also causes mortality among bovine and cattle.

As per Ministry of Agriculture, Government of India the year-wise reported deaths, Cattle and canine species are 417 (2011); 555 (2012); 487(2013); 8086 (2014) and 96 (2015). The annual cost of rabies (as per WHO) is to the extent of US \$6 billion per year including an estimated US \$1.6 billion for PEP. The majority of deaths are estimated to have occurred in

Asia (59.6%) and Africa (36.4%). Rabies is endemic in India with the exception of Andaman, Nicobar and Lakshadweep Islands. Different studies quote different figures of Animal Bites incidence and deaths due to rabies in human. The WHO –APCRI 2004 Study estimated 17.4 million animal bites and 20000 deaths /year due to Rabies in India.

The Million Deaths Study 2012, India has estimated 12700 deaths due to furious rabies. The number of Animal Bites reported under IDSP has increased from 42 lakhs in 2012 to 74 lakhs in 2018. The deaths due to suspected rabies as reported by 30 out of 36 States and UTs during 2017 were 593.

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Chapter 2 Global efforts for Eliminating Dog mediated Human Rabies

Successful rabies control programmes have been implemented throughout the world, demonstrating that elimination is technically feasible in different country contexts. Canine rabies vaccination has helped countries such as United States and Great Britain to eliminate canine rabies. Countries in Western Europe, South America have successfully control rabies.

Even the nations economically challenged regions of sub-Saharan Africa and Asia were able to maintain sufficient coverage. In the Philippines and Indonesia, rabies campaigns are also leading to a drastic reduction in cases and good progress towards elimination in selected provinces. This has been proven by successful efforts in several countries, including eradication in Malaysia in 1999.

Table 1- Global efforts by the Countries to eliminate dog mediated canine rabies

Location	Activities undertaken	Outcomes
Latin America and the Caribbean 1980–2013	<ul style="list-style-type: none"> Development of regional programmes for rabies control involving mass dog vaccinations, PEP provision, surveillance and education programmes 	> 97% reduction in human rabies cases region-wide
	<ul style="list-style-type: none"> Regional surveillance system (SIRVERA) 	Zero dog-mediated human rabies reported in 28 of 35 countries
Bangladesh 2010–present	<ul style="list-style-type: none"> Over 5-fold increase in government investment to sustain and expand rabies control activities in 2017-2022 	>90% reduction in human rabies cases
	<ul style="list-style-type: none"> Capacity building: training dog vaccinators and dog catchers 	
	<ul style="list-style-type: none"> Switch from dog population control to mass dog vaccination campaigns 	
	<ul style="list-style-type: none"> Free PEP for bite victims 	
Mexico 1990–2000	<ul style="list-style-type: none"> Media and community engagement 	Zero human rabies deaths
	<ul style="list-style-type: none"> Mass dog vaccination campaigns 	
	<ul style="list-style-type: none"> National rabies notification Decentralized surveillance system 	
Philippines (Visayas) 2010–present	<ul style="list-style-type: none"> Rabies prevention, education and awareness activities 	> 80% decrease in human rabies cases from 2008 to 2013; > 40% reduction from 2008 to 2015
	<ul style="list-style-type: none"> Establishment of a national rabies database 	Two provinces, five island municipalities and five smaller islands declared rabies-free
	<ul style="list-style-type: none"> Mass dog vaccination campaigns 	
	<ul style="list-style-type: none"> Use of dog vaccine banks 	
South Africa (KwaZulu-Natal)	<ul style="list-style-type: none"> Training and awareness materials for medical staff and the public 	Elimination of human rabies in KwaZulu-Natal
	<ul style="list-style-type: none"> Dog vaccine banks and strategic dog vaccination in high-risk “corridors” 	Expansion of control activities to neighbouring areas such as Eastern Cape, Lesotho and Swaziland
	<ul style="list-style-type: none"> Free PEP for bite victims 	
	<ul style="list-style-type: none"> Rabies stimulus packages to support expansion of control activities 	
Sri Lanka 1990–2014	<ul style="list-style-type: none"> National notification of human and animal rabies cases 	> 85% reduction in human rabies cases
	<ul style="list-style-type: none"> Mass dog vaccination and sterilization campaigns 	

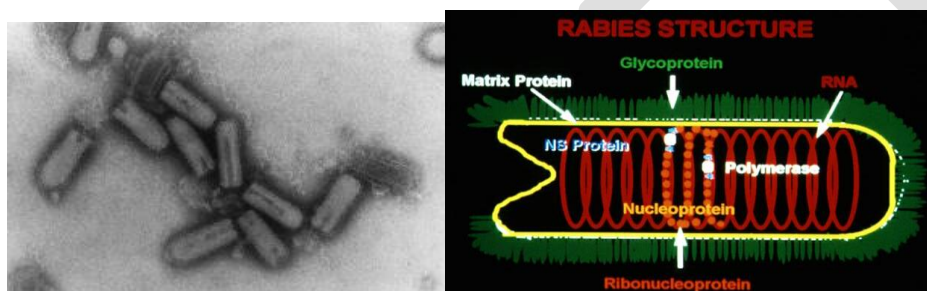
Location	Activities undertaken	Outcomes
	<ul style="list-style-type: none"> • Free PEP for bite victims 	
United Republic of Tanzania (south-east) 2010–2015	<ul style="list-style-type: none"> • Novel mobile phone surveillance system • Mass dog vaccination campaigns • Cost-saving switch from intramuscular to intra-dermal PEP 	>75% reduction in animal bite cases (proxy for rabies exposure) across project site. Local elimination of human cases on Pemba Island by 2014
Bhutan Ongoing	dog vaccination dog population management activities in southern districts, cross-border control of dog movement	reduction in human rabies cases

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Chapter 3 Epidemiology, Host Range and Clinical Signs of Rabies

Rabies virus

Rabies is an acute encephalitis caused by lyssavirus infection. The etiological agents of rabies encephalitis belong to the Mononegavirales order, the Rhabdoviridae family and the Lyssavirus genus (2). Lyssaviruses have non-segmented RNA genome of negative polarity that encodes five viral proteins (3' to 5'): a nucleoprotein (N), a phosphoprotein (P), a matrix protein (M), a glycoprotein (G) and an RNA-dependent RNA polymerase (or large protein, L). The lyssavirus particle is shaped like a bullet, 100–300 nm long and 75 nm in diameter and can be seen only through an electron microscope. Rabies virus is present in the saliva of rabid animals. Upon biting, scratching, or licking on broken skin (cuts/ abrasions) and intact mucus membrane, the virus enters the body.



Host Range

All warm-blooded animals are vulnerable to infection by rabies virus, however the degree of species susceptibility varies considerably. In India, the domestic dog is the major reservoir of rabies.

Rabies in Humans

The virus enters the body through wounds or by direct contact with mucosal surfaces; it cannot cross intact skin. RABV may replicate in muscle or other local tissues after exposure and gains access to motor endplates and motor axons to reach the central nervous system. The incubation period ranges from 3 weeks to 3 months (rarely 4 days to 2 years). Once the virus reaches the CNS, rabies replication occurs primarily in the neurons or brain cells through viral budding and the virus spreads and infects the nearby brain cells. Dissemination through the cerebrospinal fluid (CSF) occurs in the late stages of infection.

Rabies affects brain stem function, causing Hydrophobia (fear of water), Aerophobia (fear of breeze), and/ or Photophobia (fear of light), and finally resulting in respiratory paralysis and death. In 80% of humans rabies manifests as neurologic or furious types and remaining 20% manifests as Paralytic or Dumb type.

The furious rabies manifests as Hyperactivity (anxiety, agitation, running, biting, bizarre behavior alternating with periods of calm) which may occur spontaneously or may be precipitated by tactile or auditory, visual or other stimuli. The most characteristic symptom is spasm of the pharyngeal muscles often triggered by an attempt to drink water (hydrophobia) or by blowing air on patient's face (aerophobia). Spasmodic contractions of the muscles may spread to the respiratory and other muscles leading to attacks of apnoea.

The paralytic or dumb rabies manifests as acute progressive ascending myelitis, symmetrical or asymmetrical with flaccid paralysis, pain and fasciculation in the affected muscles with mild sensory disturbance. A complete paraplegia develops eventually with fatal paralysis of the respiratory and pharyngeal muscles.

Rabies in animals

In general, rabid animals of all species commonly exhibit typical signs of central nervous system disturbances with behavioural changes.

Rabies in dogs

The incubation period of rabies in dogs is 3–8 weeks on average, but may vary from 10 days to as long as 6 months, but is rarely more than 4 months. There may be hyper excitability or lethargy, pharyngeal paralysis and thus frothing of saliva, posterior paresis or paralysis, sudden coma and death. Behavioural changes are common during the early phases of the disease when the dog behaves abnormally, hides in dark corners, shows unusual agitations, becomes restless. Fever, dilatation of the pupils and photophobia are sometimes present. The furious form follows the prodromal phase and the affected dogs may bite without any provocation. It may bite itself and inflict serious injuries. Some dogs exhibit only a paralytic stage with the characteristic dropped jaw and incoordination. Progressive paralysis begins with the muscles of the head and neck region. The tone of bark changes due to partial paralysis of vocal cords. Convulsions are seen in the terminal phase followed by incoordination and posterior paresis. Once the clinical signs sets in, the disease progresses rapidly to the death of the animal due to respiratory failure generally within 3-8 days.

Rabies in Cats

The clinical signs in cats is of furious type and is similar to that in dogs but the affected cats have a greater tendency to hide in secluded places and are more vicious than dogs. The cat might strike in air with its forepaws as if it is catching imaginary mice. After 2-4 days of the excitation phase, the paralysis of posterior third of the body follows.

Rabies in cattle

Livestock are vulnerable victims for rabid carnivores and mongoose The average incubation period of rabies in cattle is 15 (depend on the site of bite) days and the average morbidity period is 4 days. The major clinical signs in cattle includes excessive salivation, behavioural changes, muzzle tremors, vocalization (bellowing), low-pitched voice due to paralysis of vocal

cord (may mistake for heat sign), aggression, hyperesthesia and/or hyper excitability, and pharyngeal paresis/ paralysis, coma and death. 2.7.3.

Rabies in sheep and goats

The clinical signs in sheep includes muzzle and/or head tremors, aggressiveness, hyper excitability, and/or hyperesthesia, trismus, salivation, drooping ears, vocalization, and recumbence and death.

Rabies In horse and mules

The signs are similar to tetanus. The average incubation period is 12 days (depend on the site of bite) and the average morbidity period is 6 days with majority of the horses developing furious rabies. Muzzle tremors, pharyngeal spasm or pharyngeal paresis, ataxia or paresis, lethargy or somnolence are the common signs manifested by rabid horse.

Rabies in Pigs

The symptoms are characterised by excitement, irritation, rooting up the ground or rubbing at the surface, aggressiveness, biting of hard objects, other animals and man, paralysis and death in 2-4 days.

Rabies in Monkeys

Clinical signs exhibited are similar to that in humans with hydrophobia, paralysis, anxiety. Non-human primates play a negligible role in spread of the virus.

Chapter 4 International Guidelines for Countries for Declaring Rabies Free

If a geographical region needs to be declared rabies free, it should be assessed on the basis of both, OIE criteria for (animal rabies) as well as WHO criteria for (human rabies). Following are the guidelines from OIE and WHO for declaring a region/country as rabies free.

OIE Guidelines:

OIE criteria for declaration of rabies-free status are set for the purposes of animal health, international trade and movement of animals. In order to declare rabies free territory or zones, guidelines have been prescribed by Terrestrial Animal Health Code published by OIE as under:-

- Rabies is made notifiable;
- An effective system of disease surveillance is in operation;
- All regulatory measures for the prevention and control of rabies implemented including effective importation procedures;
- No case of indigenously acquired rabies virus has been confirmed during the past 2 years. However, this status would not be affected by the isolation of Bat Lyssavirus;
- No imported case in carnivores has been confirmed outside of a quarantine station for the past 6 months.

As per the OIE, A country or area that is free of dog rabies is one in which:

- No case of indigenously acquired infection due to dog-mediated RABV has been confirmed in humans, dogs or cats or any other animal species at any time during the previous 24 months.
- Any autochthonous positive case was shown by molecular characterization and epidemiological investigation to be a spill over from wildlife. If an imported case in carnivores is confirmed, the status of the country or area shall not be affected if molecular characterization confirms the non-indigenous source of the virus, and epidemiological tracing backwards and forwards reveals no evidence of secondary dog infections.

WHO Guidelines

With a global target of “Zero human deaths due to dog-mediated rabies by 2030”, worldwide, harmonized processes are required to acknowledge and measure country progress towards this goal. WHO has divided countries in 5 different stages of rabies elimination:-

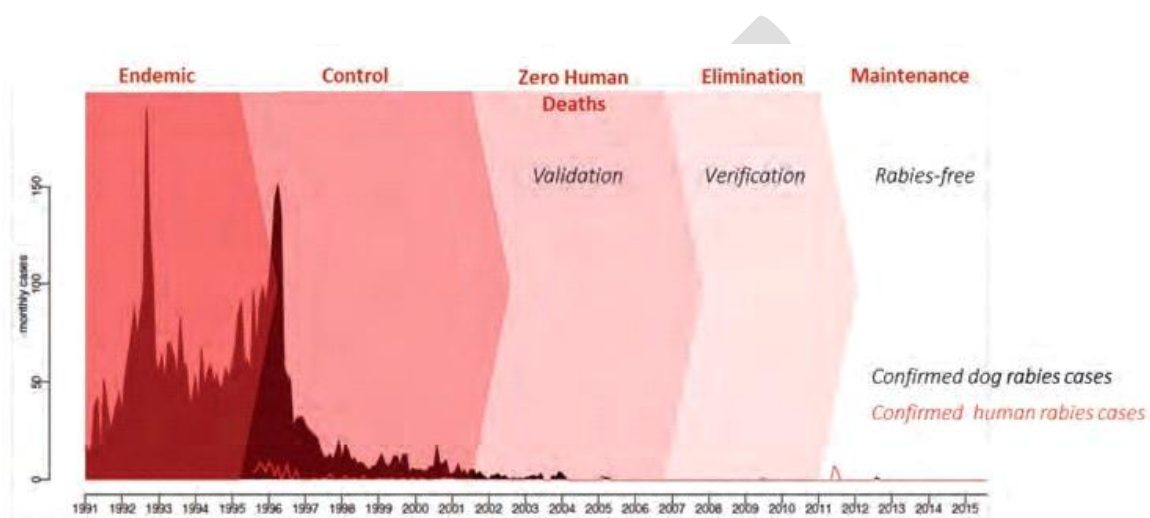
Endemic stage- ‘Endemic’ indicates the number of confirmed rabies cases per month in an endemic country with limited control measures in place.

Control stage- indicates a steep decrease in rabies incidence after mass interventions.

- Zero human rabies death- shows interruption of dog–human rabies transmission and no human deaths.

Elimination Stage -shows interruption of rabies transmission and no canine case

Maintenance Stage- refers to continuing freedom from disease, e.g. by preventing incursion and/or re- emergence of canine or humanrabies. As per WHO, many countries have yet to reach zero human rabies deaths, while others have, or are close to, interrupting rabies disease transmission.



The figure is based on country data and shows rabies elimination (in terms of canine and human rabies cases) in a continuum of five phases, from endemicity, to elimination, to maintaining freedom from disease.

A country or area that is free of dog rabies is one in which:

- No case of indigenously acquired infection due to dog-mediated RABV has been confirmed in humans, dogs or cats or any other animal species at any time during the previous 24 months.
- Any autochthonous positive case was shown by molecular characterization and epidemiological investigation to be a spill over from wildlife. If an imported case in carnivores is confirmed, the status of the country or area shall not be affected if molecular characterization confirms the non-indigenous source of the virus, and epidemiological tracing backwards and forwards reveals no evidence of secondary dog infections.
- If an imported case is confirmed, the status of the country or area shall not be affected if a risk assessment and/or molecular characterization confirms the non-indigenous source of the virus and epidemiological tracing backwards and forwards reveals no evidence of secondary infections in any wild or domestic

carnivore. Laboratory-confirmed infection in some wild animals (e.g. mongooses) should be considered an indicator of the presence and circulation of rabies.

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Chapter 5 Current efforts for Rabies Prevention and Control

As Rabies is a zoonotic disease, its prevention and control largely depends multi-sectoral collaboration wherein not only the role of health sectors is required but also the role of veterinary and wild life sector sectors is also very important. For years rabies remained a neglected diseases but with the phasing out of Nerve Tissue Vaccine in 2006, the Rabies prevention and control in India gained a momentum in India and National Centre for Disease Control, which is WHO Collaborating centre for rabies epidemiology, played an important role in sensitization of all stakeholders to make rabies a priority Zoonosis. The efforts undertaken by the various sectors are briefly described as under:-

Efforts undertaken by Health Sector:-

1. Control of Human Rabies – Pilot Project: In 11th Five year Plan, Ministry of Health and family welfare approved a pilot project on prevention and control of human rabies.
2. National Rabies control Program: Initiative' under 11th Five Year Plan. The project was implemented by NCDC in 5 cities Delhi, Ahmedabad, Pune, Bangalore and Madurai and project begin from January 2008 and continued till 2012. The **objectives** of the project were prevention of human deaths due to rabies, enhance awareness in general community, develop trained health manpower, and strengthen diagnostic facilities, strengthening surveillance and maintenance of continuous surveillance and sensitization of other sectors.

With the lessons learnt in the pilot, Ministry of health and Family Welfare has approved National Rabies Control Programme (NRCP) in 12th Five Year Plan for roll out in entire country. During 12TH Five year, from 2014 to 2017 , a small pilot was also taken to test the strategy of animal Health Component in Haryana and Chennai through Animal Welfare Board of India(AWBI). The program has its presence in 25 States and 3 UTs as on date.

The objectives of the program are to prevent the human deaths due to rabies by Capacity Building, advocacy for scaling up utilization of ID route for Rabies prophylaxis, increasing awareness in general community, strengthening surveillance of animal bites and rabies cases and Strengthening Rabies Diagnostics and Intersectoral coordination. Following activities has been undertaken under the program.

1. **Trainings on Animal Bite Management:** Organization of trainings for the health professional is an important objective of the program. Under the program National level Training of master trainers has been undertaken on appropriate animal bite management, Rabies Post Exposure Prophylaxis and inoculation of Anti Rabies vaccine. Many States have organized training States and district level health professionals

2. **Guidelines** - National Guidelines for Rabies Prophylaxis is the technical guidance document for the health care professionals with all information on decision to treat an animal bite victim, Categorization of wound, Doses and schedule for Rabies Pre and Post Exposure prophylaxis, RIG infiltration and other evidence based technical information on Rabies. The guidelines are periodically revised from time to time as per latest scientific development and as per expert opinion. Program has developed Operational Guidelines for State officials for implementation and monitoring of the program in the States
3. **Strengthening of Surveillance:** Program has undertaken several initiative to improve surveillance of animal bites and rabies cases. Animal bite data from all states is received from IDSP portal and Standard case definition for Suspected, probable and confirmed rabies case has also been developed and incorporated in IDSP/IHIP portal. Networking with ID hospitals to provide data on rabies deaths is being strengthened and efforts are underway for making Rabies as a Notifiable Disease.
4. **Strengthening Rabies Diagnostic capacity-** Under the program strengthening laboratory capacity of the identified institutes for rabies diagnostics is an important objective. Four laboratories across the countries has been identified and supported under the program to function as regional Rabies diagnostic labs. These laboratories are :
 - i. Department of Neuro-virology and WHO Collaborating Centre for Rabies Diagnostics NIMHANS, Bangalore
 - ii. Rabies laboratory, Division of Zoonosis at National Centre for Disease Control –Delhi
 - iii. Disease Investigation Unit, Veterinary Hospital Complex, Tonca- Caranzalem, Goa.
 - iv. Department of Microbiology, AIIMS Jodhpur
5. **Information Education and Communication activities-** Various myths are prevalent in the general community about rabies and management of animal bites. To increase awareness about the fatal nature of the disease and do's and don'ts in the event of animal bites, IEC activities are envisaged and undertaken at national and state level. Under the program Standard IEC material as audio video spots for mass dissemination and prototype print material is created for States

With continuous advocacy, technical and financial support the program is gradually achieving the target of sensitizing the State Governments especially health sector to prioritize Rabies and strengthen the facilities for management of Animal Bite Victims. The program has been able to sensitize the Veterinary stakeholders to recognize canine Rabies as an important public health problem.

Efforts undertaken by Veterinary sectors:

1. Department of Animal Husbandry, Dairying under Ministry of Fisheries, Animal Husbandry and Dairying had a scheme '*Assistance to States for Animal Diseases (ASCAD)*', in which Grant in aid is provided to the State Animal Husbandry departments for canine vaccinations. GIA is also provided for training of manpower, strengthening of labs, strengthening State Biological Production Centres and immunization for other animals.

The centre has identified One Central disease diagnostic lab, 5 Regional disease diagnostic lab and 256 State laboratories for disease diagnosis.

2. Activities carried by the Municipal Corporations: In the urban areas, undertake the stray dog management under the Animal Birth Control (Dogs) Rules', 2001. The Municipal council dog squad pick up unsterilized dogs (males and females) and are neutered/sterilized, given the anti-Rabies vaccination, returned after 2 - 4 days and the right ear of the dog is clipped to indicate that it is sterilized.

Efforts by Non-Government Organizations and Private sectors:-

Several NGOs and Animal Welfare Organization are playing an important role in the fight against rabies. Few of them are Humane Society International, World Veterinary Services, Mission Rabies are undertaking the dog population management and vaccination programs. Veterinarians across the state in urban areas conducts awareness shows, vaccinations programmes in coordination with NGOs. These efforts are fragmented and intermittent, and do not have a long term impact.

The professional organizations such as Association for Prevention and control of Rabies in India (APCRI) and Consortium against Rabies are also contribution in sensitizations and capacity building of the health care professional in Rabies

Chapter 6 Legislations

There are legislative backup for the health sector and animal health sector in India and these legislations are implemented by different stakeholders. These legislations are as follows:-

1. The Prevention & Control of Infectious and Contagious Diseases in Animals Act, 2009:-

The Government of India has enacted an Act namely ‘‘The Prevention and Control of Infectious and Contagious Diseases in Animals Act, 2009’’. The Act has come into force in all the states/ UTs. **The list of notifiable diseases by the states is given in the schedule of the Act.** The states have been empowered to take necessary action to appropriately deal with disease situations.

- The provisions of the Act strengthen the power of the State Governments to effectively tackle, control and eradicate the animal diseases.
- This act aims to prevent spread of economically important infectious and contagious diseases from one part of the country to another, to control animal diseases of public health significance on a national basis and promote import and export of animals and animal products by meeting India’s international obligations.
- Rabies is one the schedule diseases as per the Act.
- The act also specifies the roles of government officers in times of diseases outbreak, for animal segregation, identification of controlled areas, prohibition of movement, provide vaccination, and undertake other precautionary measures.

2. ‘Prevention of Animal Cruelty Act- 1960’ and the ‘Animal Birth Control (Dogs) Rules’, 2001

The ‘Prevention of Animal Cruelty Act- 1960’ has established the ‘Animal Birth Control (Dogs) Rules’, 2001, prescribing humane methodology for street dog population management, ensuring rabies eradication, and reduction in man–dog conflict based. (Legal verdict are to be followed during DPM by any authorities including time to time verdicts given by court).

3. Epidemic disease act, 1984-

The main aim of this Act is to prevent the spread of Dangerous Diseases. When at any time the State Government is satisfied that the State or any part is threatened with, an outbreak of any dangerous epidemic disease, and when the State Government, thinks that the ordinary provisions of the law for the time being in force are insufficient for the purpose, may take, or require or empower any person to take, measures and, by public notice, prescribe temporary regulations to be observed by the public as it shall deem necessary to prevent outbreak or the spread of such disease.

4. Municipality Act, ()

This act varies from state to state. Most of the municipalities act are based on these points:-

Under the municipality act, prevention of dangerous diseases defines the actions to be taken in case of dangerous disease which includes rules such as;-

- Obligation to give information of dangerous disease
- Removal of patients to hospital suffering from dangerous disease
- Disinfection of buildings and articles along with Methods of disinfection
- Destruction of infectious huts or sheds
- Special measures in case of outbreak of dangerous or epidemic diseases or threatened by an outbreak of any dangerous disease among the inhabitants or animals.

Dog Registration -Requires the Registration of dogs, with a collar and a metal token.

The owner or person in charge of any dog, shall not allow the animal without a muzzle, chain when the owner knows that the dog is likely to annoy or intimidate any person. (Legal verdict are to be by any authorities including time to time verdicts given by court).

Rabid animals- Any dog or other animal which is, or is, reasonably suspected to be, suffering from rabies, or has been bitten by any dog or other animal suffering or suspected to be suffering from rabies should detain such animal.

- In case of prevalence of rabies, The Commissioner, by public notice, can direct that dogs shall not be at large without muzzles and chain.
- Owners shall allow any ferocious dog to be at large without being muzzled, or urge the animal to attack or intimidate any person.
- Owners shall or knowing or having reason to believe that any dog or animal belonging to him or in his charge has been bitten by an animal suspected or confirmed with Rabies
- Should fail or neglect to give immediate information of the fact to the Commissioner or give information which is false.

Chapter 7 One Health Approach for Rabies Elimination

Rabies is a classic “One Health” challenge: more than 99% of these deaths arise from exposure to a rabid dog. Vaccines exist to prevent canine rabies as well as human vaccines, after a dog bite. However, imperfect awareness compounded by variable accessibility of PEP has resulted in the persistence of human rabies fatalities. Rabies is a typical example of a zoonotic infection which does not fit into the domain of any one single department having the responsibility of controlling Rabies. Although there is an animal reservoir involved, mortality and morbidity mainly affect human beings. Therefore, for prevention, control and elimination of Rabies an effective and concerted efforts from animal husbandry department, Human Health Department, Local governing bodies, communities and other stakeholders, is the need of the hour.

Until now, rabies elimination efforts have been fragmented and uncoordinated across various stakeholders and regions. In 2015, The World Health Organization (WHO)/FAO/OIE had declared a vision for the elimination of dog-mediated rabies is 2030 and called for action by setting a global goal of zero human dog-mediated rabies deaths by 2030, worldwide and thereby contributing as part of the SDG 2.

As rabies disproportionately affects poor and rural communities, eliminating human deaths from rabies is also consistent with SDG 1 to “end poverty in all its forms” and the commitment of Member States to “leave no one behind”.

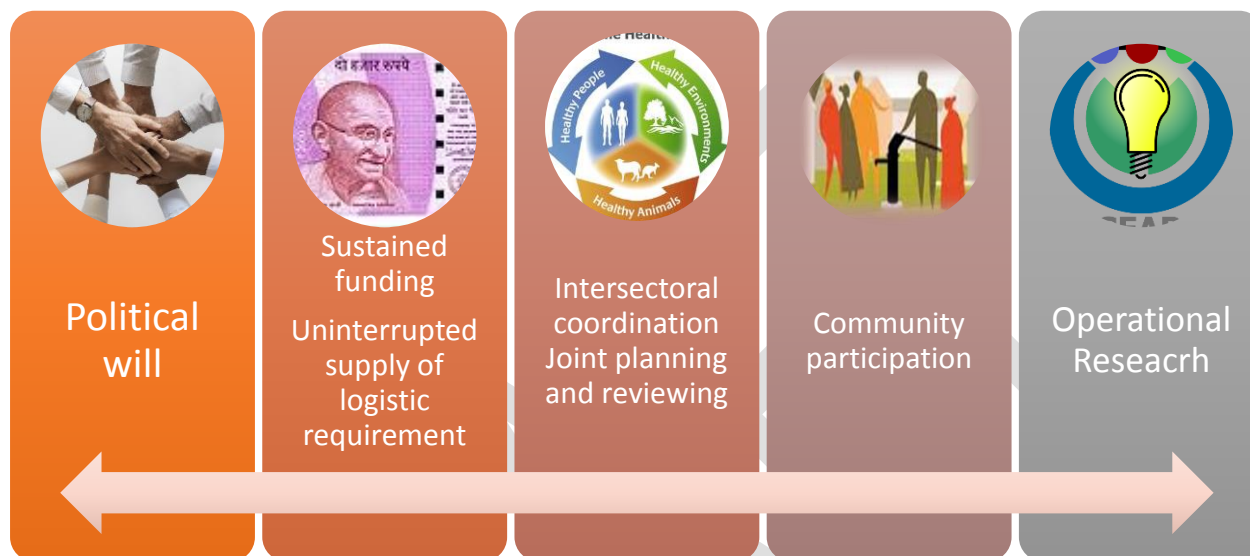
The One Health approach is the most successful model which have been adopted by many countries for rabies elimination. NRCP can yield tangible results only if it is backed by commitment at the highest level in the country through a national policy on control of rabies.

Chapter 8 National Action Plan for Rabies Elimination in India- (NAPRE)

Approach for Rabies Elimination:

The NAPRE is based on recommendations of various international agencies such as WHO, OIE, and Global Alliance of Rabies Control (GARC).

The successful implementation of National Action Plan for dog mediated Rabies Elimination in India is based on 5 major pillars:-



The National Action Plan for Rabies Elimination (dog mediated) in India provides a broad framework for combating Rabies. The NAP-RE is a guidance document for the states/ stakeholders to develop their own action plan, specific to their needs.

Vision: To reduce human deaths due to dog mediated rabies to zero by 2030.

Mission: To progressively reduce and ultimately eliminate human rabies in India through sustained mass dog vaccination and appropriate post-exposure treatment.

Vital elements

The National Action Plan for Rabies Elimination (dog mediated) in India is based on following three vital elements.

Prevention: Introduce cost-effective public health intervention techniques to improve accessibility, affordability and availability of post-exposure prophylaxis to all people in need.

Promotion: Improve understanding of rabies through advocacy, awareness, education and operational research.

Partnership: Provide coordinated support for the anti-rabies drive with the involvement of community, urban and rural civil society, government, private sectors and international partners.

Components of NAP –RE

The National Action Plan Rabies Elimination will have two key strategic components to achieve the Elimination of Dog Mediated Human Rabies:-

1. **Animal health component:** To achieve at least 70 % of the vaccination coverage among dogs in a defined geographical area annually for 3 consecutive years.
2. **Human health component:** To prevent human deaths due to rabies by ensuring timely access for post exposure prophylaxis for all animal bite victims

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Chapter 9 Stakeholder involved in NAPRE

The prevention, control and elimination of Rabies requires an effective and concerted efforts from all stakeholders. The key stakeholders involved have been compartmentalized into the Core Ministries, Supporting Ministries and private partnerships as under:-

A. Core ministries

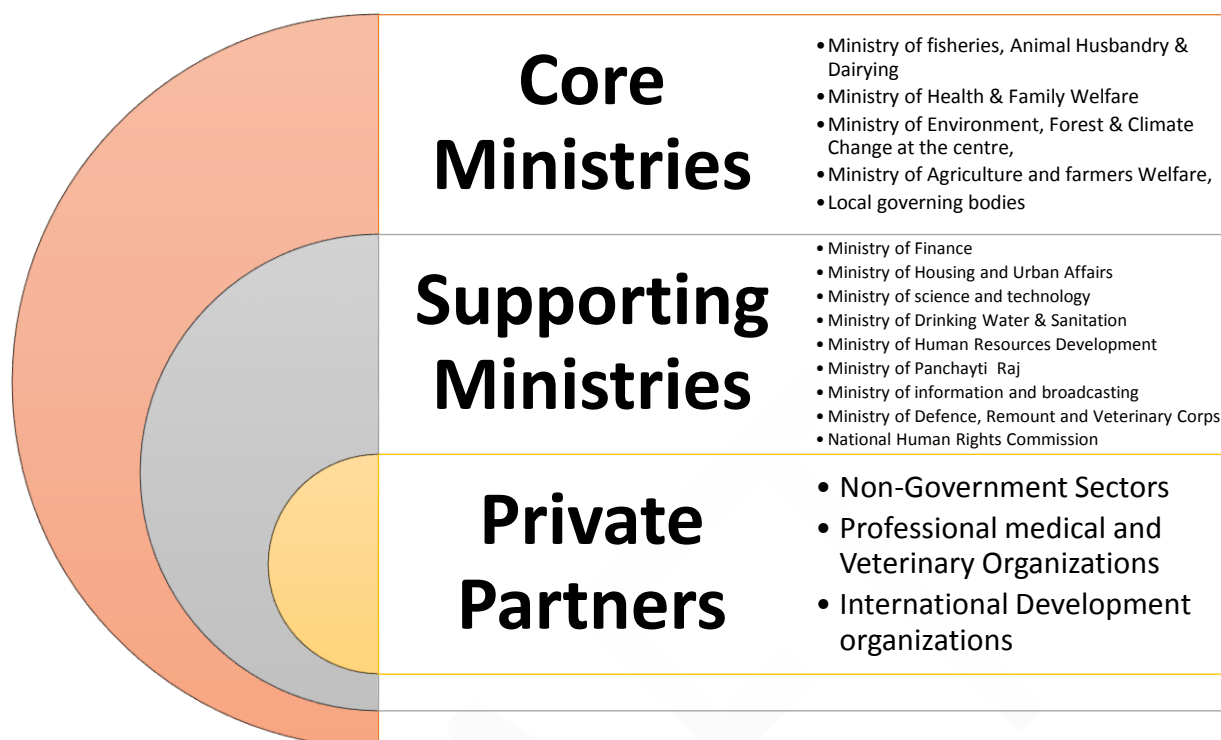
1. Animal Health sector- Ministry of fisheries, Animal Husbandry & Dairying at centre and state animal Husbandry department at state and below level,- core
2. Human Health sector- Ministry of Health & Family Welfare at centre, State Health Department at state and below level
3. Wild life and environment sector-Ministry of Environment, Forest & Climate Change at the centre, Forest Department at the state level
4. Ministry of Agriculture and farmers Welfare, DARE/ ICAR at the centre
5. Municipal Cooperation

B. Supporting Ministries

1. Ministry of Finance
2. Ministry of Housing and Urban Affairs
3. Ministry of Science and Technology
4. Ministry of Drinking Water & Sanitation
5. Ministry of Human Resources Development
6. Ministry of Panchayati Raj
7. Ministry of Information and Broadcasting
8. Ministry of Defence, Remount and Veterinary Corps
9. National Human Rights Commission

C. Private Partners

1. Non-Government Sectors
2. Professional medical and Veterinary Organizations
3. International Development organizations



The Role of all the Stakeholders in implementation of NAP –RE is as under:-

Role of Health Sector:

At the centre, Ministry of Health and Family Welfare, National Centre for Disease Control will be the key stakeholder and nodal agency for overall planning, coordination and implementation of the human health component in the country. The state, district and below district level activities will be implemented through the existing health systems. The key role of the health sector under this NAP-RE will be as under-

- ▶ Advocacy with different stakeholders for prioritizing rabies to achieve commitment at all levels so that resources could be mobilized for prevention and control of rabies.
- ▶ Ensure accessibility, availability of treatment of all animal bite victims and rabies patients.
- ▶ Capacity Building and Training of health professionals in appropriate animal bite management and Rabies Prophylaxis at all level
- ▶ Production of standard education (IEC) materials for wider circulation
- ▶ Strengthening maintenance of database on Rabies control program (e.g. vaccination coverage), analysis and sharing of information with other stakeholders
- ▶ Strengthening Public Private Partnership through Engagement with professional organizations such as IMA, IAP, and communities /organizations involved in field of rabies for undertaking research, and other activities.

- ▶ Strengthening of Rabies diagnostic laboratories including the standardization of protocol for diagnosis for ensuring uniformity across diagnostic laboratories in the country identified.
- ▶ Intersectoral coordination and sharing of information between the animal health, and wild life health sector for facilitating better implementation.
- ▶ Regularly updating technical guidelines on Rabies
- ▶ Regulation of rabies sera and sera producing pharmaceuticals as per the drugs and cosmetics act, 1940 and rules.
- ▶ Monitor and evaluate the control programs implemented by the field units
- ▶ Coordinate and conduct operational research on Rabies in collaboration with national, international, diagnostic and research institutions

Role of Veterinary Sector:

At the centre, Ministry of Fishery, Animal Husbandry and Dairying, GOI will be the key stakeholder and nodal agency for technical guidance to the states for the activities planned under animal health component. The program in the States will be implemented through State Veterinary department of State Government, Municipalities and Panchayati Raj Institutions. In this NAP, the role envisaged for animal sector are as follows:-

- ▶ Advocacy with different stakeholders for prioritizing animal rabies to achieve commitment at all levels so that resources could be mobilized for elimination of rabies.
- ▶ Mapping of high risk, medium risk and low risk areas of rabies in association with health department and other stakeholders to prioritizing areas for MDV and DPM
- ▶ Ensure uninterrupted supply of logistics (money, manpower and material) for undertaking strategic mass vaccination, ring vaccinations activities for the areas targeted for rabies elimination.
- ▶ Capacity building for Veterinary Professional, Paravets, dog catchers, post vaccination survey staff and other allied personnel
- ▶ Strengthening of Rabies diagnostic laboratories for veterinary sector
- ▶ To develop standard (IEC) materials for wider circulation
- ▶ Intersectoral coordination and sharing of information between the health, and wild life health sector for facilitating better implementation.
- ▶ To be part of joint investigations whenever there is a human rabies case or increasing dog bite cases.
- ▶ Liaise with different stakeholders/agencies/international organizations (e.g. FAO, OIE, WHO, SAARC) for technical support
- ▶ The possibility of linking the NADRS, NADRES to IHIP portal for selected parameters to be explored.
- ▶ Regularly publishing and updating technical guidelines on Rabies
- ▶ Regulation of rabies sera and sera producing pharmaceuticals as per the drugs and cosmetics act, 1940 and rules.

- ▶ Monitor and evaluate the control programs implemented by the field units
- ▶ Coordinate and conduct operational research on Rabies in collaboration with national, international, diagnostic and research institutions
- ▶ Establishment/strengthening of check-post/quarantine centers since unvaccinated as well as diseased animals can easily enter and introduce rabies in areas where rabies cases have reduced.
- ▶ To coordinate with the stakeholders involved in strategic DPM.

Role of Ministry of Agriculture and farmers Welfare,

At the centre, ICAR, in the Ministry of Agriculture and farmers Welfare, GOI at the centre will be the nodal agency for coordinating, guiding and managing research and education in animal sciences to the states for the research activities planned under animal health component. In this NAP, the role envisaged for ICAR are as follows:-

- ▶ Including Animal Rabies as a priority disease in the curriculum of veterinary students in colleges.
- ▶ Veterinary Colleges & Veterinary Universities can Incorporating training of veterinary students on MDV and Mass DPM as per AWBI norms.
- ▶ Increase the involvement of veterinary students in activities of MDV and MDPM.
- ▶ Framing technical guidelines, SOPs and monitoring framework on Rabies elimination
- ▶ Coordinate and conduct operational research on Rabies in collaboration with National, International, Diagnostic and Research Institutions.

Role of Wild Life Sectors

Most of the villages and rural areas in India are surrounded by forests. This increases the risks of transmission at the Domestic-wild life interface hence collaboration between livestock and forestry sectors (wildlife) is equally important. In this NAP, the role envisaged are as follows:-

- ▶ **Formulate** technical guidelines and monitoring framework for wild life rabies,
- ▶ Identify rabies endemic areas near zoos.
- ▶ Undertake surveys in wild life reservoirs.
- ▶ Capacity building of zoo personnel's to handle wild life rabies cases.
- ▶ Ensure pre exposure prophylaxis for rabies zoos personnel, wildlife workers and animal handlers
- ▶ Ensure pre exposure prophylaxis rabies vaccinations for zoos animals
- ▶ Disseminate (IEC) for zoo visitors and animal handlers/ zoo workers
- ▶ Sharing of Rabies disease outbreak information among wild animals to DAHD and Health sector
- ▶ To undertake research on wild life sentinels, transmission pattern and spillovers of Rabies virus from wild animals to domestic animals.

- ▶ To undertake Active surveillance to identify the wildlife reservoirs.
- ▶ To undertake Risk assessment in areas adjoining the forests, sanctuaries and national parks.
- ▶ Jackal/predator proof sheds for livestock should be made compulsory to those families who lives near the WPA/Forest/Sanctuary
- ▶ Pre-exposure rabies vaccination protocols should be done routinely for dogs and livestock living around Wildlife Protected Area (WPA)/Forest/Sanctuary
- ▶ To undertake Proper disposal of animal carcasses near the WPA/Forest/Sanctuary
- ▶ Implementation of three-four layered agro-forestry plantations should be adopted for prevention of wildlife-domesticated animal conflict in fringe area of villages and fallow area near the WPA/Forest/Sanctuary.
- ▶ The Wildlife Sanctuaries / National Parks marked for the conservation of wild cats by NTCA, can to consider about the control of stray dog population and Anti Rabies Vaccination clubbed with Mass Vaccination for Distemper & Parvo Virus to avoid the threat to life of wild cats.

Role of Animal Welfare Board of India:

- ▶ To ensure implementation of Prevention of Cruelty to Animal Act, 1960 in coordination with the state government and local bodies.
- ▶ To work with the state veterinary department, and coordinate with the local governing bodies for developing a strategic Dog Population Management plan as per the ABC Rule ,
- ▶ Creation of dedicated Animal Welfare Para-Police/Animal Law Enforcement Agency by the state.
- ▶ The AWOs, could be made Jurisdiction -wise responsible for Dog-bites, and coordinate with the local governing bodies to see that dog-bite Victims are attended efficiently.

Role of Urban and Rural Local Governing Bodies-

(Municipal Corporation, ZillaParishad, gram panchayat)

As per the Panchayat raj Act and Municipality act, the local self-government, councils, and corporations are in charge of implementing the Animal Birth Control programs. These acts are to be implemented as per the guidelines (eg. guidelines for stray dog vaccinations, and dog population management). The activities envisaged for LGB are:-

- ▶ Gram Sabha to be convened immediately to inform the public regarding the incidence of rabies and needs for various mitigation measures and legislation.
- ▶ members can Report immediately to A.H, Health Dept. when an unusual incidence of dog bite or potentially rabies case in their respective ward
- ▶ Members can ensure that human bite victim (exposed) gets proper (full dose) medical treatment.
- ▶ List of patients (exposed) to be maintained in the respective ward/village and follow up measures to be done strictly

- ▶ Members to monitor and strictly implement mass vaccinations campaign of dogs in their respective ward
- ▶ Resolution can be passed in Gram Sabha regarding restriction of movement of dogs in their respective ward and complete ban on importation/introduction of new dogs
- ▶ Members to monitor pet owners and encourage them to register and vaccinate their pets
- ▶ Members to monitor MDV and DPM plan undertaken by the concerned agency. Coordination with health and veterinary sectors for strategic Mass vaccination of stray dogs
- ▶ Members can monitor solid waste management in their wards and Identify problem areas of waste collection points and ensure proper waste management to prevent conglomeration of stray dogs in such areas
- ▶ information sharing on animal bites and rabies cases to the local animal husbandry department, health department and local authority
- ▶ To provide required logistics for undertaking DPM and Mass stray dog vaccinations such as dog pounds (ABC Center with Operation Theatre/ Mobile Clinic & Dog Kennels), Dog Vans & Logistic Support to run the program as per the ABC (Dogs) Rules, 2001
- ▶ Monitoring of slaughter houses and meat stalls with existing laws (Food Safety and Standards Authority of India, licensing and Registration, 2011) and regular monitoring of waste generated from these units.

Role of Ministry of Human Resource Development

Children are most vulnerable to dog bites. It is therefore important to include rabies in the formal education system at all levels.

- ▶ Prevention of Rabbits and animal bite management incorporated in school health program
- ▶ Inclusion of the basic prevention and control measure for rabies in the school curriculum in order to sensitize children and youth about the disease and measure to be undertaken in case of animal bites.
- ▶ Capacity building of teachers on first aid measures in the event of animal bites
- ▶ To ensure that dogs in the school and education campus are vaccinated against Rabies.
- ▶ Ensure proper waste management in school compounds since there have been reports of increasing numbers of dogs in School premises primarily due to easy access to food

Role of Ministry of Drinking Water and Sanitation and Ministry of Housing and Urban Affairs- Swachh Bharat Mission

Swachh Bharat Mission, an initiative of Government of India has the objective of improving the sanitation by eliminating open defecation, eradicating manual scavenging, managing municipal solid waste through modern and scientific techniques, generating awareness about sanitation. The role of this mission regarding solid waste management should be explored by the governing bodies as this would help in maintaining clean garbage areas and thus invariable the stray dog population. SBM in rural areas is implemented by ministry of Drinking Water

and Sanitation, and in urban areas by Ministry of Housing and Urban Affairs. Role of these ministries through the Swachh Bharat Mission is as under-

- ▶ Monitor solid waste management in their wards and Identify problem areas of waste collection points and ensure proper waste management to prevent conglomeration of stray dogs in such areas. Steps should be taken to exclude dogs from sources of food (e.g. rubbish dumps and abattoirs, and Installing animal-proof rubbish containers.
- ▶ IEC on maintaining clean neighborhoods and how it corresponds to the dog population.
- ▶ Strict monitoring of waste generated from slaughter houses and meat stalls with existing laws i.e Food Safety and Standards Authority of India (FSSA Regulations) (licensing and Registration) 2011.

Role of Ministry of Finance

The Ministry of Finance (MOF) should provide adequate fund for implementation of NAP-RE in the country. The adequate budget provision for rabies prevention and dog population control should be made available at different levels to all stakeholders. MOF should provide contingency fund for rabies outbreak containment in addition to the routine prevention and control activities.

Role of International organizations

International organizations such as the World Organization for Animal Health (OIE), World Health Organization (WHO), Food and Agriculture Organization (FAO) and other organizations can provide technical support for implementing the strategic components of the NAP-RE.

Role of Police Department

Need to designate a dedicated contact point at every Thana not below the rank of Sub Inspector for enforcement of various animal welfare and right related laws. A separate animal welfare law cell under the Department of Police needs to be established for strict compliance/enforcement of various provisions of statutory laws

Chapter 10 Strategies for NAPRE

The strategies for the two components i.e human health and animal health component are described as under:-

Strategies for Human Health Components:

The key strategic actions to achieve the objective of human health component are as under

1. To Ensure availability of Anti Rabies Vaccine and Anti Rabies Serum to the all Animal Bite Victims at all levels of health facilities

- ▶ To advocate the states for utilization of cost affective Intra-dermal rabies vaccines for Rabies Post Exposure Prophylaxis by organizing Sensitization workshops for stakeholders at national/ regional level for shifting IM to ID route – sensitization of health professional both in government and private sectors to routinely practice ID route instead of IM route for rabies prophylaxis
- ▶ Financial assistance to states from Centre through earmarking funds for ARV/ARS procurement in National Free Drugs Initiative scheme and inclusion of ARV/ARS in Essential drug list at all level
- ▶ Strengthening infrastructures for treating the victims of animal bites- by establishing Model Anti Rabies Clinics
- ▶ Ensuring Availability of Trained manpower with respect to appropriate animal bite management/ID inoculation/ ARS infiltration
- ▶ Ensure uninterrupted supply of ARV/ARS and close Monitoring ARV/ARS demand and supply positions to avoid stock out positions ([Annexure 14](#) - guidance document)
- ▶ Ensuring and upgrading adequate cold chain facilities to store ARV/ARS stocks at appropriate levels.
- ▶ Establishing Monitoring mechanism for recording and reporting of Adverse Event Following Rabies Immunization.

2. Capacity building of professionals in appropriate animal bite management-

- ▶ Training of health professional and paramedical on Rabies pre & post exposure prophylaxis as per National Guidelines
- ▶ Training of State, districts and below district level health care professional on program management's aspects.
- ▶ Joint Training of Health and Veterinary professional on operational aspect of Rabies Elimination plan
- ▶ Trainings and capacity building of laboratory professionals on rabies diagnostics
- ▶ Trainings on Surveillance of Animal Bites and Rabies Case investigations and Notification.

3. To encourage pre-exposure prophylaxis for High Risk Groups-

- ▶ Identifying the high risk population (ex. street children, dog catchers etc) for animal bites in high prevalence districts/states and provision of pre-exposure prophylaxis as appropriate in coordination with all stakeholders.
- ▶ Sensitization of professionals and formulation of protocols for safety of health workers/ professional exposed to environment conducive for rabies virus transmission.
- ▶ Promoting pre-exposure prophylaxis among children through involvement of Indian Academy of Paediatrics and Rabies is an optional vaccine in IAP Schedule

4. Strengthening Surveillance of animal bites and rabies cases in human-

- ▶ Ensuring implementation of rabies notification in Human health sectors through web portal for notification of animal bite victims / rabies cases.
- ▶ Strengthening periodic reporting system about animal bites and rabies incidence through IDSP and IHIP
- ▶ Resource mapping – mapping the facilities (State/ District wise) for management of Animal bite victims , Treatment facilities for suspected Rabies cases or Infectious Diseases hospitals and mapping of laboratories for rabies diagnostic
- ▶ Establishing Sentinel surveillance system for animal bite cases through Model Anti Rabies Clinics .

5. To strengthen diagnostics capacity on Rabies:

- ▶ To identify and establish Rabies referral laboratories at National, regional and state level in the state government medical colleges, Infectious disease hospitals or tertiary care hospitals as per the need of the program. These labs will provide the recommended ante mortem and post mortem diagnostic facilities such as Directs Fluorescent Antibody test/ Sellers Stain/ Molecular Diagnosis by PCR and ELISA.
- ▶ To identify and establish at least one laboratory at District level-(District Public Health Laboratory under IDSP)- To do Anti Rabies Antibody titre estimation by ELISA (to help decision making in Rabies Pre/Post Exposure Prophylaxis protocol)
- ▶ Trainings and capacity building of lab professional (National / State level Training workshop) by periodic and hands on training on rabies diagnostics.

6. To promote Operational research in the Rabies-

- ▶ To estimate rabies burden and incidences of Animal bites
- ▶ Estimations of Coverage of ARV and ARS among animal bite victims, Compliance and drop out rate of the vaccination, and AEFI if any
- ▶ Study to examine the operational feasibility and effectiveness for the modified regimen for Rabies post exposure prophylaxis
- ▶ To study the health seeking behaviours of the community and reasons for the drop out

- ▶ Mapping of Rabies biological Supply chain and market landscape
7. ***To strengthen Inter-sectoral Coordination mechanism between Veterinary and Medical sectors for regular sharing of reports/ data on animal rabies and set up guidelines for joint responses for rabies outbreak.***
 - ▶ Joint Trainings/Sensitization workshop of District level Medical/ Veterinary Department on Rabies and Joint gap analysis for formulation of Action Plan for Rabies Eliminations
 - ▶ Formulation of standard guidelines and SOPs .r.t roles and responsibilities of Veterinary/Medical sectors in the event of rabies outbreaks (reported clustering of cases among dogs and humans)
 8. ***Information Education and communication for increasing awareness about the diseases and importance of seeking timely and appropriate treatment for animal bites***
 - Development of IEC material for undertaking IEC activities (Print/ Electronic material-audio visual spots for mass media campaign.)
 - Formulation of definitive IEC Strategy/ guidelines for identified target audience (Health professional/ Veterinary professionals/ Children-school health education / Community or field workers (ASHA/ ANMs and Paravets/ General Community/ Media.
 - Including IEC especially in schools.
 9. ***Public Private Partnership through Involvement of NGO and community organizations.***
 - Advocacy for the participation of private institutes/ NGOS/ Community org in the efforts towards RABIES
 - Coordination of private/ community organizations/ NGOS

Strategies for Animal Health Components:

1. Estimation of Canine Population –

- Estimation of canine population is required to obtain data on number of stray, community owned dog and pet dogs to be vaccinated & to calculate the logistics requirement (Money, Manpower and material).
- Dog Population estimation must be done to calculate the community Owned dogs (dogs that are fed by certain communities but are roaming freely), stray dogs (unowned dogs and free roaming). Various practical tools are available include registers of dogs, population estimates, and surveys of dogs, owners, community members, and veterinarians. Dog Population estimation can be done as per the Standard Operating Procedure at [Annexure 12](#).

2. Identification of rabies risk zone

- India has huge population of stray dogs and vaccination of the entire canine population is a resource intensive procedure. Therefore with the limited resources it is prudent to identify the rabies risk zone for prioritizing rabies elimination activities in these areas as planned under NAPRE.
- The veterinary department in coordination with the Health department will identify High risk, medium risk and low risk zones at the village, block and Districts level based on the epidemiology of the rabies (number of human and animal rabies cases), number of dog bites, sharing of border with neighbouring high risk/medium risk areas. The rabies risk zone identification for prioritizing activities of Animal Health Component may be done as per technical evidences and data available in both sectors

3. Planning & implementing strategic mass dog vaccination programme –

- The objective of the strategic mass dog vaccination programme is to achieve anti rabies vaccination in at least 70 % of dog population, annually for three consecutive years and maintain the vaccination status in a defined geographic area.
- Mass Dog Vaccination against Rabies could also be prioritized in the areas where Mass ABC Surgeries have been undertaken before.
- Intensive vaccination campaigns lasting from 1 day to 1 month is effective in rabies control. Campaigns must reach at least 70% of the dog population.
- The vaccination coverage should not be compromised in pursuit of speed
- The Department of Animal Husbandry in coordination with Municipal cooperation, Panchayati institution and NGOs has to take the lead in strategic mass dog vaccination campaigns.
- Private veterinary practitioners, veterinary students could also play a role in MDV.
- The MDV can be done as per the Standard Operating Procedure at [annexure 9](#).

4. Assessment of Post vaccination coverage-

- To assess the success of mass dog vaccination it is essential to conduct sero-monitoring of the vaccinated dog population.
- A survey should be undertaken within one week of the MDV campaign in the vaccinated areas to assess the numbers of marked /unmarked dogs, and conduct proportional counts (count the number of dogs with colour mark) and also by using questionnaire survey of the household.
- A revaccination campaign should be organized if the coverage is found to be below 70% of the estimated dog population.
- The details of animals vaccinated in the field could be reported using the Monthly Animal Health Report Form to the local authority
- The local authority then can issue a completed mass vaccination certificate to the village/block/district.
- The Post vaccination coverage can be done as per the Standard Operating Procedure at [annexure 3](#)(to be developed).

5. Dog population management

- Dog population management -to limit the man-dog conflict and to reduce the numbers of stray dogs to an acceptable level through Animal Birth Control.
- To establish a strategic robust Dog population Management
- It is desirable that state veterinary sector to coordinate with the stakeholdersinvolved in DPM such as Local Governing Bodies, Ngo, and AWBI.
- Creation of dedicated Animal Welfare Para-Police/Animal Law Enforcement Agency
- A permanent, dedicated Manpower for Animal Birth Control and Anti-Rabies Vaccination Programme could be used.
- Concept of Community dogs should be included, and AWOs, should be identified as Care-takers for their Sterilization and Vaccination.
- The AWOs, could be made Jurisdiction -wise responsible for Dog-bites, and coordinate with the local governing bodies to see that dog-bite Victims are attended efficiently.The Dog population Management can be done as per the Standard Operating Procedure and AWBI rules.
- Vet colleges could be involved in the DPMprogramme's.

6. To promote responsible dog ownership

- Promoting responsible dog ownership is important to make the community understand the behaviour, ecology, basic needs of dogs.
- This should include advocacy and ensuring that pet dogs or community owned dogs are properly vaccinated and treated against diseases. Advocacy among the community about preventing dog bites, preventive vaccines and waste management.
- Advocacy to promote registration of pet dogs and also community owned dogs legislature

7. Solid waste management

- The proper solid waste management is important as domestic garbage/waste attracts stray dogs leading to increase in population and increase in incidences of dog bites. Environmental control of stray dogs is an effective strategy for DPM by reducing the

access to food to stray dog by ensuring proper food waste disposal. The following two activities are important is SWM:-

- a. Identifying hotspots in the community where congregations of dogs is common.
- b. Creating awareness among communities about waste management and its relation to increase in dog population.

8. Community involvement-

- Building partnerships, social mobilization and ensuring community participation is crucial for the success of the NAPRE.
- Community involvement in rural and urban areas is necessary for identifying problem areas, identifying bite victims, ensuring treatment compliance, effective vaccination camps, and responsible dog ownership and reduce human dog contact.
 - i. In urban areas- Resident Welfare Associations, Cooperative Societies (any societies registries under the Society Registration Act
 - ii. In rural areas- Gram Panchayats, & Gram Sabhas
 - iii. Collaboration among different departments, authorities, NGO and medicos, veterinarians in private sectors will be required for best utilization of the available resources.

9. Confinement and containment

- As per the Prevention and Control of Infectious Disease Act, 2006, rabies is a notifiable disease in animals. The state government should ensure that all the measures as per the Act should be followed in case of animal rabies.
- Isolation wards must be created for Rabies Suspected Dogs / Animals by the veterinary sector (both animal husbandry department and Local governing bodies) and Provisions must be made with respect to their maintenance of these facilities.
- Guidelines of AWBI be followed to in deciding the fate of such suspected dogs / animals.

Chapter 11 Rabies Surveillance under the NAPRE

The success of any elimination programme depends on accurate assessment of the ground realities, morbidity and mortality data and an understanding of the epidemiological trends. Surveillance is a key element in NAPRE so that problems can be identified and actions could be undertaken taken in timely manner. This will become even more important as India works to move along the Stepwise Approach towards Elimination of dog mediated rabies by 2030.

Both health and Animal Health components will have standard parameter to be incorporated in their existing surveillance systems and sharing mechanism will be defined on agreed parameters for effective implementation and monitoring of the activities.

Surveillance of Human Health Component on NAP-RE

Recording & reporting of each and every case of Animal bite and Rabies cases occurring in community is very essential step for maintaining the surveillance of Animal bite and Rabies cases. Rabies surveillance aims to establish quality data on disease burden in humans as well as animals in order to identify population at risk in humans as well as animals. The surveillance of Animal Bites and Human Rabies cases will be undertaken through existing IDSP/IHIP portal. NRCP has devised various recording and reporting formats at each level of health facility which needs to implement to fill the existing gaps in data availability.

Following Recordings and reporting formats should be available at health facilities providing Animal Bite Management facility. (PHC/Anti Rabies Clinic /CHC/ Sub divisional hospital/ District Hospital / Medical College etc.)

- 1) Animal bite register
- 2) Rabies PEP card in duplicate (One for the bite victim and another for ARC record)
- 3) Monthly reporting format for Health Facility
- 4) Human rabies cases monthly report from Infectious Disease Hospital (ID hospital) /any other hospitals to district NRCP officer.

Standard case definitions for rabies in IDSP/IHIP: Rabies surveillance under integrated disease surveillance programme (IDSP) is of two type's i.e.

1. Suspect Case : To be reported in S Form (by Health Worker)

Definition: Death of a human with history of dog bite few weeks/months preceding death

Wherever available, the details of such cases should be shared in a line list– Name, Age, Gender, Address

2. Probable Case : To be reported in P form (by Medical Officers/Doctors)

Definition: A suspected human case plus history of exposure[#] to a (suspect[¥] / probable[€]) rabid animal

[#]Exposure is usually defined as a bite or scratch from a rabies-susceptible animal (usually dogs). It could also be lick exposure to open wound, abrasion, mucous membranes of the patient.

[¥]A suspect rabid animal is a rabies-susceptible animal (usually dogs) which presents with any of the following signs at time of exposure or within 10 days following exposure: unprovoked aggression (biting people or animals or inanimate objects), hypersalivation, paralysis, lethargy, abnormal vocalization, or diurnal activity of nocturnal species. Whenever the history of mentioned signs cannot be elicited, the history of exposure to rabies-susceptible animal would be considered adequate.

€A probable rabid animal is a suspect rabid animal (as defined above) with additional history of a bite by another suspect / probable rabid animal and/or is a suspect rabid animal that is killed, died, or disappeared within 4-5 days of observing illness signs.

3. Laboratory Confirmed case : to be reported in L-Form (by Laboratories having confirmatory test facilities for rabies)

Definition: A suspect or a probable human case that is laboratory-confirmed[§].

§ Laboratory confirmation by one or more of the following:

Detection of rabies viral antigens by direct fluorescent antibody test (FAT) or by ELISA in clinical specimens, preferably brain tissue (collected post mortem).

Detection by FAT on skin biopsy (ante mortem).

FAT positive after inoculation of brain tissue, saliva or CSF in cell culture, or after intracerebral inoculation in mice or in suckling mice.

Detectable rabies-neutralizing antibody titre in the serum or the CSF of an unvaccinated person.

Detection of viral nucleic acids by PCR on tissue collected post mortem or intra vitam in a clinical specimen (brain tissue or skin, cornea, urine or saliva).

Note : Wherever available, the details of such cases should be shared in a line list as per line list design of IDSP.

Actions to be taken by Medical officer in charge health facility / District Nodal officer/ State Nodal officer NRCP:-

For Animal bite cases	For Human Rabies cases
<ul style="list-style-type: none"> • Identify areas of clustering of animal bite cases • Ensure the availability of ARV/ARS in centers catering the identified areas • Notify to Vet. Dept /Municipalities to initiate appropriate measures- DPM, MDV • Conduct meeting with vet. Dept. as part of zoonotic committees for joint action • Follow up 	<ul style="list-style-type: none"> • Identify areas of human rabies cases • Find out reasons (Incomplete treatment , NO PEP taken by victims, low awareness etc) • Ensure the availability of ARV/ARS in centers catering the areas • Intensify IEC activities in the area • Notify to Vet. Dept/Municipalities to initiate appropriate measures- DPM, MDV • Conduct meeting with vet. Dept. as part of zoonotic committees for joint action • Follow up

Keys points regarding surveillance activities of the human health component

1. Recordings and reporting formats should be available at health facilities providing Animal Bite Management facility. (PHC/Anti Rabies Clinic /CHC/ Sub divisional hospital/ District Hospital / Medical college etc.
2. At village and Sub centre Level, AHSA and ANM need to report animal bite cases through S form of IDSP/Event alert form under IHIP.
3. At PHC level/ Block level animal bite and rabies cases are reported through monthly reporting form of NRCP as well as P form of IDSP.

4. At District level animal bite and rabies cases are reported through monthly reporting form of NRCP as well as P form of IDSP.
5. At State level animal bite and rabies cases are reported through monthly reporting form of NRCP as well as P form of IDSP.
6. Medical colleges and infectious disease hospital/tertiary care hospital having in patient facility for rabies case management should shared the line list the rabies cases to respective district nodal officer and NRCP division at nrcp.ncdc@gmail.com.
7. At every level (sub centre, PHC, District, State) coordination should be made with veterinary counterpart for rabies vaccination of dogs and dogs population management.

Surveillance of the Animal Health Components

Surveillance programme shall include Clinical/Physical, Pathological and Serological Surveillance as per the OIE guidelines and as per the guidelines issued by DAHD, Concerned State Veterinary Authority and ICAR. Surveillance of rabies in dogs will comprise of clinical and laboratory based surveillances.

Clinical surveillance

Surveillance is based on the clinical features seen in animals known as Syndromic surveillance. If the clinical diagnosis of rabies is unclear, the dog can be quarantined and observed; however, if the signs progress, humane euthanasia should be performed by the responsible authority.

- ▶ Cases are suspected clinically on the basis of signs and symptoms in the animal.
- ▶ Dogs exhibits two forms of the Rabies, Dumb form and Furious form.

Proposed case definitions and Surveillance activities to be undertaken by veterinary officer in case of Suspected, Probable and lab Confirmed animal rabies are mentioned in table below (as per the WHO guidelines)

Case	Definition	Surveillance activity to be done
Suspected Animal rabies	<p>A case that is compatible with a clinical case definition of animal rabies</p> <p>An animal that presents with any of the following signs-</p> <p><i>‘hyper salivation, paralysis, lethargy, unprovoked abnormal aggression (biting two or more people or animals and/or inanimate objects), abnormal vocalization and diurnal activity of nocturnal species’</i></p>	<p>Vet to Notify local authorities, medical officer of a suspected rabid animal.</p> <p>Collect the primary history of an animal if available (ownership status, vaccination status, previous exposure, date of onset of signs).</p> <p>Collect or send the samples from central nervous system for laboratory diagnosis, if available.</p>

	<i>Or any animal showing the signs of dumb form of rabies</i>	
Probable animal rabies	A suspected case + reliable history of contact with a suspected, probable or confirmed rabid animal and/or An animal with suspected rabies that is killed, died or disappears within 4–5 days of observation of illness	Systematically record secondary information, and link to primary history. Notify the appropriate local authorities (NGO, gram panachayat member) and medical officer. Collect or send the samples/ carcass for laboratory diagnosis, if available.
Confirmed animal rabies	A suspected or probable animal case confirmed in a laboratory	Notify the appropriate authority
Not a case	A suspected or probable case that is ruled out by laboratory tests or epidemiological investigation (i.e. appropriate quarantine period in eligible animals).	Notify the appropriate authorities. Systematically record laboratory diagnosis, and link with primary history.

Laboratory surveillance

Lab based surveillance would be done when the suspected/confirmed animal is dead and post mortem is done and laboratory confirmation is needed to confirm whether the cases was rabies. This is especially important when the dog is known to cause dog bites in an area.

- **Sero surveillance-** A structure based survey shall be conducted regularly to determine sero-conversion post mass dog vaccination as per the prescribed guidelines to monitor the dog vaccination activities.
- **Virological Surveillance-** The brain tissue samples from carcasses (especially dogs and cats) shall be collected and subjected to rapid antigen detection test and FAT to find a rabies case. Samples tested positive to FAT could be archived for molecular analysis and research purpose to identify the circulating virus in the region.

Surveillance on the virus circulating among animals and seroconversion studies in animals that has been treated with anti-rabies vaccination following rabid dog bites could be undertaken by research laboratories, research institutes and veterinary institutes.

Surveillance in free ranging Wild animals

As rabies virus is maintained in wide range of wild animals, activities under this will be undertaken by state forest department.

In case of any clinical signs/pathological lesions of suspected rabies is detected in any susceptible free ranging wildlife, the respective wildlife/forest authorities should inform the veterinary department. The samples will be referred to regional /state/ national laboratory by respective wildlife/forest authorities.

Mechanism for surveillance for animal health component under NAP-RE.

Surveillance is proposed to be conducted through real-time and regular interval reporting system.

Surveillance Data collected should be exchanged with public health authorities.

Clinical surveillance- Each livestock clinic and district veterinary hospitals should collect information on rabies status in animals from their respective areas/ village.

The veterinarian will also inform simultaneously to the medical officer when of that area/region/block/village when there is a known history of animal biting. Veterinarian would then inform the Local civic body / authority to undertake preventive measures.

- ▶ In case of animals suspected for rabies, and in circumstances where samples cannot be collected from the suspected rabid animal or a laboratory diagnosis cannot be made, cases to be recorded as **suspected animal rabies** cases on the basis of clinical signs.
- ▶ All the dogs involved in human bite cases should be identified, and notified to the local authority and the concerned local medical officer as per the attached format (at [Annexure 13](#))
- ▶ Such animal should be quarantined if possible, for observation.
- ▶ In case of death of the animal appropriate sample, (only the head in case of large animal and the entire carcass for small animal) to rabies diagnostics laboratory identified by the state or the local veterinary college by the block/district Veterinary Officer for confirmation.

For laboratory surveillance- Existing RDDDL and Regional Coordinators may be identified as designated laboratories.

- Once the designated laboratory has been set up, it shall then be notified by DAHD
- Designated laboratories at the Sub-Divisional / District / Regional Level, shall be responsible for testing samples.
- Laboratory based diagnosis by Lateral Flow Assay (LFA) and Direct Fluorescent Antibody assay (DFA).
- The samples positive for FAT should be informed to the National referral lab .The DAHD may maintain the national data, perform analysis and provide feedbacks to all the stake holders in the country. Sample Reporting format to share with the health facility for district level and block level is attached at [annexure 13](#).
- The analyzed report shall support validating by WHO/OIE/FAO and for Stepwise approach towards elimination of rabies in India and determine the stages of rabies elimination we are in.

Chapter 12 Laboratory Diagnosis of Rabies

Diagnosis of human and animal rabies is a challenge due to lethality of the rabies virus and difficulties encountered to obtain the samples for undertaking laboratory diagnosis. However strengthening of rabies diagnostics at various level is essential for the country while envisaging a plan to eliminate rabies. A definitive, reliable diagnosis of rabies in humans and animals requires appropriate laboratory structure with adequate biosafety measures. The importance of various laboratory methods in humans and animals and their importance is as under:

The importance of diagnosis of rabies in humans

Although as the diagnosis of Classical Rabies can be made easily based on the typical clinical signs and symptoms but the paralytic form of rabies often are difficult to diagnose. Apart from this, the laboratory support for Rabies is important for the following:-

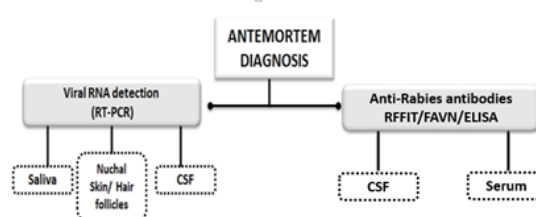
- Confirmation of clinical diagnosis-especially in paralytic/atypical cases
- Patient Management/Barrier Nursing/Disinfection of ICU facilities
- Prophylactic vaccination to relatives, clinical & nursing staff
- Characterization of causative agent/molecular epidemiology
- National Rabies Control Programme/NAPRE: Surveillance and estimation of disease burden
- Confirmation/Monitoring of disease-free status (e.g Andaman/ Nicobar & Lakshadweep Islands, Nilgiris, Goa, Sikkim etc)

The various laboratory tests available for humans (Ante-Mortem & Post-Mortem) and animals(post-mortem) are as under:-

1. Ante-mortem diagnosis in humans

Ante mortem diagnosis in humans can be done in the following method-

- By detecting the antigen, i.e the Viral RNA, in suspected rabies cases which should be done by RT- PCR. Samples such as saliva, nuchal skin/hair follicle should only be used.
- By detecting the antibody response in suspected rabies cases which should be done by RFFIT which is the Gold standard.

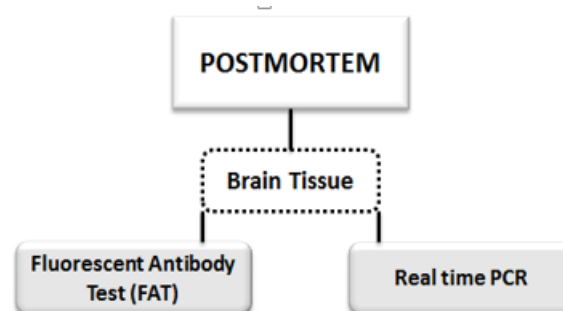


Limitations of the AM Diagnosis of Rabies is that obtaining AM sample is a cumbersome and often difficult given the clinical condition of the patients. The tests available are of Low sensitivity and the Positive test results although 'rule in' rabies, but the Negative test results cannot 'rule out' rabies.

2. Post-mortem diagnosis in humans

Post-mortem diagnosis in humans can be done in the following method-

- a. By detecting the antigen, i.e the Viral RNA, in suspected rabies cases, which should be done by RT- PCR. Brain tissue samples should only be used.
- b. By detecting the antibody in suspected rabies cases which should be done by FAT which is the Gold standard and brain tissue sample should be used.



Limitations of the Post-mortem Diagnosis of Rabies is that obtaining Post-mortem brain sample is difficult as the consent of the family/relative is necessary for an autopsy and given the cultural practises of the country it is often difficult to get this consent. However with the advancement of technology the other feasible method for post-mortem brain tissue collection (such as through intranasal/orbital/occipital route) needs to be promoted among medical professionals.

3. Ante-mortem diagnosis in animals- In animals ante-mortem is not feasible and cannot be done.

4. Post-mortem diagnosis in animals

Post mortem diagnosis in animals can be done in the following method-

- a. By detecting the antigen, i.e the Viral RNA, in suspected rabies cases, which should be done by RT- PCR. Only the brain tissue samples should be used.
- b. By detecting the antibody in suspected rabies cases which should be done by FAT which is the Gold standard and brain tissue sample should be used.
- c. Test like Lateral Flow assays are now available to be used as rapid tests at the field level by using Brain tissue sample.

Limitations of the post-mortem diagnosis of Rabies is that obtaining post-mortem brain sample in animals is difficult. However with the advancement of technology other feasible method for post-mortem brain tissue collection such as through foramen magnum may be promoted among veterinary professionals.

Organization of laboratory network for rabies diagnosis in NAPRE

Under the NAPRE, it is envisaged that a tiered structure of the laboratory facilities for Rabies diagnosis needs to be established at various levels in the phased manner. The laboratory facilities at various level will be entrusted to provide trainings, diagnosis, surveillance and quality monitoring of the activities undertaken for both human health and animal health component.

A. National Referral Laboratories

National Referral Laboratories will be identified which will serve as a National Referral Lab (NRL) for the human as well as animal samples. The capacities of these NRL will be strengthened in a phased manner. The manpower will be trained on various epidemiological and microbiological aspect of Rabies including Virus isolation, PCR, FAT, DRIT, Rapid test (LFA), Anti-rabies titre estimation for diagnosis of rabies.

Activities are envisaged at NRLs are:-

1. All positive samples will be archived.
2. A subset of samples will be sequenced to determine the genotype and maintain a national database on the virus genotypes circulating in the population.
3. Formulation and dissemination of guidelines
4. Technical support, capacity building and supervision of all the sub national laboratory activities
5. Provide technical assistance to the stakeholders for implementation of the NAPRE
6. Participation in WHO/OIE proficiency testing and overall quality control
7. Research and survey activity
8. To issue certification for international transportation of pet animals such as dogs and cats
9. To facilitate and coordinate sharing of data and line list of Rabies cases to all the stakeholders and subnational labs.

B. Regional Referral Laboratories

Regional Referral Laboratories (RRL) will be identified which will serve as a Regional Referral Lab for 5 to 6 states in its jurisdiction to support the Rabies diagnostics in human as well as animal samples. The RRLs may be established at the identified medical and/or veterinary institute. The services provided by RRLs will be same as the NRLs except quantum of the services.

C. State level

State Referral Laboratories (SRL) will be identified for rabies diagnosis in selected medical colleges laboratory/ veterinary institutes, infectious disease hospitals and tertiary care institutes. The State Referral Laboratories will undertake capacity building on various epidemiological and microbiological aspect of Rabies including Virus isolation, PCR, FAT, DRIT, Rapid test (LFA), Anti-rabies titre estimation for diagnosis of rabies.

Virus Research Diagnostic Laboratory (VRDL) at Medical Colleges strengthened by ICMR may also be identified as a state reference lab for the human and animal samples.

D. District Laboratory for Rabies Diagnosis

These laboratories would be collocated with the model Anti Rabies Clinics (ARC) at the district hospitals. The capacities of these labs will be strengthened in a phased manner. These laboratories will perform the testing and would also be linked to SRLs, RRLs and NRLs and other ARCs in the district, sub-district levels in the region. The manpower will be trained on using FAT, DRiT, LFA and Anti-rabies titre estimation by ELISA.

Below the district i.e at block level no standalone rabies diagnostic facilities are envisaged, however the Rapid Diagnostic Tests (RDTs) like LFA by the Block veterinary department will be promoted for confirmation of clinical diagnosis of animal. For all humans ante mortem and post mortem diagnosis, the samples will be referred to the higher level as per the standard guidelines.

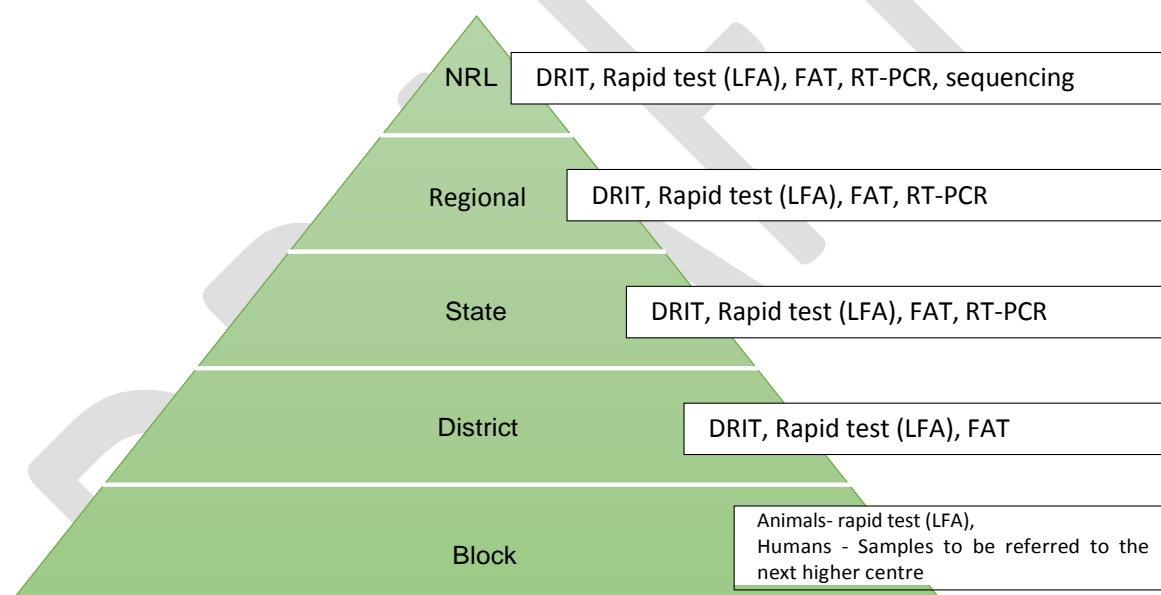


Figure 1 Network of Laboratories and Tests available at various levels

Chapter 13 Development of State Action Plan for Dog Mediated Rabies Elimination from India (SAPRE)

State nodal officers of health department and veterinary department will prepare joint state action plan for rabies as per the needs of the state. The steps in development of **state action plan** is as follows:-

1. **Joint Gap analysis to be done by each stakeholder-** As each state in the country varies as per the burden of animal bites & Rabies, Resources in health & veterinary sector hence each state needs to develop the state action plan based on the needs for the respective state as under. Joint Steering Committee at State Level needs to steer the preparation of action plan through Nodal officers of health and veterinary sectors. Following are basic domain in which gap analysis of each state is to be undertaken
 - a. Estimate the Burden of rabies in state and identify the population at risk /vulnerable population
 - b. To identify the high risk areas at the districts and block level
 - c. Identification and mapping of health facilities in the areas wherein animal bite management and management of rabies in patients is to be done.
 - d. Identification of veterinary infrastructure, veterinary clinics, local NGOs and municipal / civic bodies' active in the areas.
 - e. Identification of laboratory facilities in the state in both the sectors
2. **Identification of earmarked funds-** Health and veterinary sector needs to identify the funds that could be made available for the activities to be undertaken for rabies control . For human health component, funds to be explored under NRCP in NHM PIP for each year. State may also allocate additional funds from state budget based on the requirements. For veterinary sector availability of funds under ASCAD scheme, RKVY scheme, ABC scheme of AWBI, fund provision under individual municipalities, urban local bodies and State Animal Husbandry Department needs to be explored.
3. **Identify the stakeholders involved, and define roles and responsibilities-** Each state has to identify the stake holders from Medical, veterinary and Wild life sector, education dept. science and biotechnology dept, NGOs and voluntary organisation, representative of Resident welfare associations etc. Thereafter roles and responsibilities for each stakeholder to be demarcated after consultation with each stakeholder
4. **Identify laboratory network in the State**
Different states have different surveillance needs and surveillance capabilities. Initially, designated laboratory shall be identified by the concerned states from existing State Disease Investigation Laboratories, and or Regional Coordinators.
5. **Preparation of action plan with activities to be undertaken at each level for the next 10 years.-** Based on the mapping of stakeholder and resources available for state,

each state will prepare the action plan for next 10 years to achieve elimination of rabies from the state based on the guiding principles outlined in the NAP

6. **Submission of the action plan by January 2020** –Each state is expected to prepare the action pal by January 2020. Meeting of state zoonosis committee may be undertaken to review the action plan at state level.
7. **Joint review of the action plan submitted by the state by NCDC and DAHD-** Action plan thus submitted will be reviewed by respective sectors at National level and feedback will be provided to individual state for any suggestion.
8. Implementation of the program by the state from next financial year.

DRAFT

Chapter 14 Plan of Implementation of the National Action Plan for Rabies Elimination

Based on the strategic components, it is envisaged that States will prepare a comprehensive action plan for both human and animal health components. Whereas the funds for Human health components will continued from the source from NHM, the funding for the animal health components will be explored through existing ASCAD Schemes or revenue available with Municipal corporations or State Vet Departments. The delivery of services for the animal health shall be done through the already existing veterinary infrastructures and established channels like regional Animal Husbandry Department, Urban/Rural Governing Bodies, NGOs and Municipal cooperation's.

As the human health component under the National Rabies Control Program is already being implemented in the country, the identified States Nodal Officers and District Nodal Officers will continue implementing the activities of human health component.

For Animal Health Components the respective State will identify and nominate State and District Nodal Officers selected and will coordinate with identified States Nodal Officers and District Nodal Officers of Human Health Component for implementing the activities of animal health component.

A brief about the plan of implementation for both the components is as under:

	Human health component	Animal health component
Nodal agency for planning and execution at the centre	NCDC, MOHFW Division of Zoonotic Diseases Program	DAHD, MOFAHD Division of Live Stock Health/ National Live Stock Mission (Animal Welfare)
	<ul style="list-style-type: none"> • Combined Action by both department for mapping and actions for prevention and control measures accordingly • To provide integrated training of both health and Veterinary Professional, Paravets and other allied personnel on program management and implementation. • Liaise with different stakeholders/agencies/international organizations (e.g. FAO, OIE, WHO, SAARC) for technical support • Explore the possibility of projects/donor agencies for the skill development of manpower and undertaking the disease prevention and control activities in the country. • The possibility of linking the NADRS, NADRES to IHIP portal for selected parameters to be explored Public Private Partnership through Involvement of NGO and community organizations • Monitor and evaluate the control programs implemented by the field units 	
Nodal agency for planning and execution at State level	State Health Department, State NHM Identified State Nodal Officer (SNO) for NRCP will coordinate the activities as under	State animal husbandry Departments, Director State AH dept himself of nominate a State Nodal Officer for Animal Health Component

		<p>The State Veterinary department will implement the activities of animal health component in cooperation with municipal bodies in urban areas and Panchayat systems in rural areas.</p> <p>It is the responsibility of State Animal Husbandry Department to devise methodology and assign duties to participating officer for monitoring surveillance activities.</p>
	Develop State action plan as per activities envisaged under National action plan	
District Level	<p>District health officer</p> <p>Identified District Nodal Officer (SNO) for NRCP will coordinate the activities</p>	<p>Identified District Nodal Officers (Dist. Vet Officer)</p> <p>Coordinate with the veterinary department from local governing bodies, local authority, and NGO.</p>
	Develop micro plan /district/ block action plan as per activities envisaged under state action plan	
Block LEVEL	<p>Block Medical Officers</p> <p>Implementation of the program at ground level</p> <p>Coordination with block veterinary officer</p> <p>Reporting to district nodal officer(DNO)</p> <p>Feedback to DNO for refinement/betterment of the program as per field scenario</p>	<p>Block Veterinary Officer</p> <p>Implementation of the program at ground level</p> <p>Coordination with block medical officer</p> <p>Reporting to district nodal officer, Animal Husbandry</p> <p>Feedback to district nodal officer, AH for refinement/betterment of the program as per field scenario</p>

PLAN OF IMPLEMENTATION FOR NAPRE

Short term plan- (Year 2020, 2021, 2022)-

Preparatory phase

1. Advocacy for prioritizing rabies in the State.
2. Estimate burden of human and animal Rabies in the State.
3. Identify or establish funding (eg schemes, program), components under funding (such as vaccines, training, IEC etc).
4. Establish technical guidelines on canine rabies control programme.
5. Develop training modules for medical officers, veterinarians and support staff
6. Develop a short terms plans, medium term and long term plans.

7. Development of SOP for animal bite management, dog enumeration plan, MDV, DPM as per the national guidelines and the ABC act.
8. Identify villages/talukas/districts/ based on animal bite cases and evidences as High risk areas, medium risk area and low risk areas
9. Achieve Intersectoral collaboration by sharing information with civic bodies and Health department.
10. Initiate inter departmental collaboration (DAHD, Local self-governing bodies, NGOs)through MoU
11. Form a joint steering committee at each level.
12. Identify the Regional, District Laboratories, State Reference Laboratories and National Referral Laboratories
13. Strengthen these laboratories for rabies diagnostics
14. Initiate Capacity building, Professional education and training of staff needed for activities planned
15. Develop a joint State Specific Action Plan for rabies elimination with microplan for districts as per the risk areas or Start a pilot project in selected city, district or block for implementation of program.
16. Estimate Dog population in the selected areas.
17. Estimate requirement of Human and animal ARV
18. Start aggressive campaigns for vaccination of dogs and responsible dog ownership campaign.
19. Initiate Strategic MDV in selected areas.
20. Evaluates vaccination coverage in canines
21. Develop joint Outbreak response teams

Mid-term plans- Phase 2 Activities (Year 2022, 2023, 2024, 2025)

Scale up dog vaccination

1. Continue the advocacy and creating awareness on Animal and human rabies.
2. Scale up implementation of the programme throughout the country. The results of pilot project in selected city /block/district with improvements should now be implemented in another areas.
3. Strengthening the Laboratory capacity and testing at each level as per the needs of the state
4. Establish surveillance systems, including feedback mechanisms, and coordination between administrative levels (national, state, district, municipal, etc.)
5. Evaluates vaccination coverage in canines
6. Registration of pet and community owned dogs
7. Continue mass Vaccination of dogs
8. Continue Surveillance activity for human and dog rabies, number of animal bite cases
9. Continue canine population count
10. Early diagnosis of dog bite and complete PEP (by ID methods) and Immunoglobulin
11. Strengthening Laboratory capacity and testing
12. Declare dog mediated rabies free zones (villages/blocks/districts) and state

Long term plans- Phase 3 and Phase 4 activities (2026, 2027, 2028, 2029, 2030)

Maintain dog vaccination status and Intensified Rabies Surveillance

The vaccination of dogs and DPM would be continued activity. Areas /affected districts where elimination targets have not been achieved would require adoption of corrective measures.

The long phase will be followed by certification of elimination status by the competent authority. An international review commission will certify elimination status will review the progress.

1. Continue the advocacy and creating awareness on Animal and human rabies.
2. All States implementing ID Route for Rabies PEP in major health facilities
3. Declare dog mediated rabies free zones (villages/blocks/districts) and state
4. Continue Surveillance activity for human and dog rabies
5. Upgrade surveillance of rabies from canine to other animals
6. Continue Implementation dog population management
7. Conduct joint field investigations in case of Human rabies cases
8. Characterization and analysis of circulating rabies virus variants by a national or international laboratory
9. Declare country freedom status for animal rabies OIE
10. Declare country freedom status to Human rabies WHO
11. Verify freedom from Rabies.

Chapter 15 Monitoring & Evaluation

The NAPRE envisages that joint monitoring mechanisms for both human and animal health components at all levels as well as independent component wise monitoring by the concerned stakeholder as per their respective guidelines. The independent external evaluation of the state action plan will also be undertaken periodically.

The constitution of the joint monitoring committees and component wise monitoring at all level is as per the table below:-

National Level		
Joint Monitoring	Joint Steering Committee at Central Level(Proposed) – Annexure 2 National Technical Advisory Committee – Rabies (Exists) Standing Committee on Zoonoses under DGHS (Exists)	
Component wise	The human health component would be monitored through existing NHM monitoring mechanisms (Common review missions and Joint review missions) and as per the guidelines and NCDC. Monitoring will be done as per the indicators and checklist at annexure 5 and annexure 1	DAHD (Animal Health Component) The animal health component would be monitored as per the guidelines.
Regional		
Joint Monitoring	Regional Coordinators under the intersectional coordination Program	
Component wise	Regional Directors Of Health Sector	Regional disease diagnostic labs
State Level		
Joint Monitoring	A joint monitoring committee is proposed to monitor the state action plan for NAPRE- Annexure 3	
Component wise	As per the operational guidelines of NRCP	As per the operational guidelines of State Animal Husbandry Department
District and below		
Joint Monitoring	A Joint monitoring committee is proposed to monitor the State Action Plan for NAPRE – Annexure 4	
Component wise	As per the operational guidelines of NRCP	As per the operational guidelines of state animal husbandry department

Annexure -1

Proposed Pattern of Assistance for implementing the Animal Health Component of SAPRE

For successful implementation of animal health component Sustained Earmarked funds for canine vaccinations and dog population management needs to be ensured

Costing for the various activities of animal health component planned under NAPRE- Estimating the cost for vaccination, budgeting and identification of resources in term of money, manpower and material is the key component while drafting a plan for Rabies Elimination from a particular geographical region(village/ Block/ Districts / City / State/ Region). The following budgeting of items /activities are envisaged:-

Sl. No.	Items/ Activities	
1.	Immunization	
	<ul style="list-style-type: none"> i. Cost of Anti Rabies vaccine ii. Cost of vaccination iii. Development of cold chain facilities and maintenances of coldchain. 	<p>Vaccine will be procured through tendering / from Government biological production units of the States.</p> <p>This includes expenses on needle, syringes, gloves, sterilizer, cotton, glassware & disposables, chemicals, diagnostics, supportive medicine, transportation and delivery system etc.)</p> <p>Cost of Cold cabinet</p> <p>Cost of Refrigerator</p> <p>Cost of vaccine carrier</p>
2.	Strengthening of Animal Disease diagnostics laboratories	
	<ul style="list-style-type: none"> i. Alteration/modification of DI Labs ii. alteration/modification of the ELISA labs and BSL-2 labs for the purpose of ISO and GLPcompliant iii. Reagents/ chemicals on recurring basis. iv. Rabies Test Kits v. Laboratory testing vi. Disposal of euthanized dogs 	
3.	Training Programme/ Seminars / Workshops	
	Trainings for veterinarians	Minimum 20 veterinarians in each batch
	Trainings for para- veterinarians	Minimum 20 para-veterinarians in

	Trainings for Post Vaccination Survey staff	each batch) - @ maximum Rs. per para-veterinarian
	Trainings for Dog catchers	
4.	Equipment's and Software	
	GPS device Software for canine enumeration	
5.	Post vaccination survey	
	Expenditure on routine collection of serum/ morbid materials for surveillance work, vaccination and related activities	
6.	Information and communication campaign including animal health camps <ul style="list-style-type: none"> • Funds for organizing Canine anti rabies health camps • Expenditure on community awareness/ publicity 	
7.	Vehicle Expenses Staff transport & goods vehicle Fuel allowance for Team	

Source of funds proposed for NAPRE

The funds are available in various level for undertaking the activities of human and animal component at various levels. The successful execution of the rabies elimination plan depends upon the judicious use of the available resources in an efficient manner keeping in view the **One Health Approach**. The proposed sources of funds for both the components are as under:-

Human health component		
1.	ARV -ARS	National free drug initiative. State revenue
2.	Training	NRCP- NHM, State budget
3.	IEC	NRCP- NHM, State budget
4.	Laboratory	NRCP- NHM, State budget
5.	Operational research	NRCP , ICMR

Animal health component		
1.	Vaccination	ASCAD, RKVY, State animal husbandry funds, Local governing bodies-municipalities (urban), PRI (RURAL)
2.	Training	ASCAD, PMSKY, State animal husbandry funds Local governing bodies- municipalities (urban), PRI (RURAL)
3.	IEC	ASCAD, State animal husbandry funds , Local governing bodies- municipalities (urban), PRI (RURAL)
4.	DPM	AWBI, Local governing bodies- municipalities (urban), PRI (RURAL), NGOs, Corporate Social Responsibility
5.	laboratories	ASCAD , State Animal Husbandry funds
6	Operational research	DAHD, ICAR

Annexure 2

Constitution of Joint Steering Committee at the National level

The Joint Steering Committee at the National level will be highest administrative body to advice on all matters related to the National Action for Rabies Elimination in India and the region.

Term of reference: The committee will be responsible for determining policy, implementation of the policy and monitoring of the collaborative activities planned for the programme. The National Joint Steering Committee shall monitor & provide guidance for implementation of the Rabies Elimination Plan and shall meet as often as necessary, but at least once in a year. All the matters related to rabies elimination activities at the international borders will also be dealt by this committee. The proposed constitution of the Joint Steering Committee at the National level is as under-

National Joint Steering Committee	
Secretary, MoH&FW, Govt. of India	Chair
Secretary, Ministry of Fishery, Animal Husbandry & Dairying, Govt of India	Co-chair
Special Secretary (Health), MoH&FW, Govt. of India	Member
Additional Secretary and Mission director, National Health mission MoH&FW, Govt. of India	Member
Joint Secretary (Health), MoH&FW, Govt. of India	Member
Director General of Health Services, MoH&FW, Govt. of India	Member
Animal Husbandry Commissioner, DAHD, MoFAH&D	Member
Director General, Indian Council of Medical Research	Member
Director General, Indian Council of Agriculture Research	Member
Director General, Remount Veterinary Services	Member
Chairman, Animal Welfare Board of India	Member
Joint Secretary (Livestock Health), DAHD, MoFAH&D	Member
Joint Secretary of Ministry of Science and Technology, Govt. of India	Member
Joint Secretary of Ministry of Agriculture and Farmers Welfare, Govt. of India	Member
Joint Secretary of Ministry of Human Resources Development, Govt. of India	Member
Joint Secretary of Ministry of Information and Broadcasting, Govt. of India	Member
Joint Secretary of Ministry of Environment, Forest & Climate Change, Govt. of India	Member
Joint Secretary of Ministry of Housing and Urban Affairs, Govt. of India	Member
Joint Secretary of Ministry of Drinking Water & Sanitation, Govt. of India	Member
Secretary of National Human Rights Commission	Member
Joint Secretary of Ministry of Panchayati Raj, Govt. of India	Member

Annexure 3

Constitution of Joint Steering Committee at the State level

The State Action Plan for Rabies Elimination will be formalized by the Joint Steering Committee at the State Level.

Term of reference: The committee will be responsible for monitoring of all the collaborative activities of State Action Plan for Rabies Elimination (SAP-RE). The committee will monitor the uninterrupted supply of logistics required for execution of the plan. The committee will also ensure and facilitate the integration, cooperation, collaboration and Communications required among stakeholders at all level for successful implementation of the SAP-RE with One Health Approach. The proposed constitution of the joint steering Committee at State level is as under-.

Joint Steering Committee at State Level	
Chief Secretary, State Government	Chair
Director Health Services, State Government	Co-chair
State NHM ,Mission Director,	Co -chair
Director Animal Husbandry / Animal Husbandry Commissioner, State Govt.	Co-chair
State Nodal Officers – Human Health Component	Member secretary
State Nodal Officers - Animal Health Component	Member secretary
Secretary State Animal Welfare Board	Member
Director of Department of Human Resources, State Government	Member
Director of Department of Information and Broadcasting, State Government	Member
Director of Department of Environment, Forest & Climate Change	Member
Director of Department of Housing and Urban Affairs,	Member
Director of Department of Drinking Water & Sanitation	Member
Director of Department of Human Resources	Member
Director of Department of Panchayati Raj	Member
Representative of Civic Bodies involved in rabies control	Member

Annexure 4

Constitution of Joint Steering Committee at the District Level

Similar to the State Level Steering Committee, Districts Level Steering Committee will be formed in districts. **Term of reference:** Districts Level Steering Committee will coordinate among stakeholders for implementation of the plan at the district level. Districts Level Steering Committee will review and evaluate the progress at district level. The constitution is as under -

Joint Steering Committee at the district level	
Chief District magistrate / Collector	Chair
Chief District Medical Officer/ Civil Surgeon	Co-Chair
Chief District Veterinary Officer/Deputy Director (AH)	Co-Chair
District Nodal officer, NRCP, Health department	Member
Representative Urban Governments	Member
Representative Rural Self Governments	Member
Representative NGO/ AWO	Member

Annexure 5

Indicators for Monitoring Programme at National Level - For DAHD, MoAHD and MOHFW

	Indicators	Target year 1	Target year 2	Target year 3	Source of reporting/data/ verification and sectors involved
1.	Number of states where Advocacy for rabies control program has been done at	36 States and UTs	36 States and UTs	36 States and UTs	Animal Husbandry Department, Health Department,
2.	Number of states where Legal Framework for the programme, (Acts), have been implemented for rabies notification In humans In animals	36 States and UTs	36 States and UTs	36 States and UTs	Animal Husbandry Department, Health Department,
3.	Number of states developed Technical Guidelines, Standard Operating Procedure on Rabies have been Published In humans In animals				Animal Husbandry Department,
4.	Number of states which have State Program Management Unit for Rabies				Animal Husbandry Department
5.	Number of states who have submitted SAPRE				Animal Husbandry Department, Health Department,
6.	Number of states who has planned funding for animal and human components				Animal Husbandry Department
7.	Proportion /Number of states of states who has organized training programs. Medical professionals Veterinary and allied manpower				Animal Husbandry Department, Health Department,
8.	Proportion /Number of states of states who has initiated School Health Programme for Rabies				Department of Human Resources
9.	Number of States who have completed Mass Dog Enumeration				Animal Husbandry Department, AWBI
10.	Number of States who have completed mass dog Vaccination				Animal Husbandry Department, AWBI

11.	Number of States who have completed Strategic DPM				Animal Husbandry Department, AWBI
12.	Cumulative number of state labs strengthened to carry out testing under the NAPRE Animal Husbandry Department: Health Department:	36	As per assessed need & demand from States/ UTs	As per assessed need & demand from States/ UTs	Animal Husbandry Department,

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Annexure 6

Checklist for Monitoring the State Action plan for Rabies Elimination at States/District/Block (as applicable)

Sr no	Activities checklist	Level	Responsible stakeholder	Yes/no
1.	Whether Advocacy for rabies control program has been done at the state at the highest level in Health Dept. and Animal husbandry Dept.	State	Health Dept. Animal husbandry Dept. Panchayat raj institutions Wildlife Dept. Waste management Dept School Education Dept. State animal Welfare Board Municipalities	
	State Health Dept.			
	State animal husbandry Dept.			
2.	Whether relevant Legal Framework have been institutionalized (rabies notification)	State	Health Dept. Animal husbandry Dept.	
	In Humans, Rabies Notification			
	In Animals – Infectious Disease (Act), Municipality Act, etc			
3.	Whether Source of Funds have been allocated for Rabies Control Program	State	Health Dept. Animal husbandry Dept.	
	Human health component			
	Canine vaccination component			
4.	Whether state has estimated the burden of rabies	State, district, block,	Health Dept. Animal husbandry Dept.	
	Human Rabies			
	Animal rabies			
5.	Whether stakeholders have been identified for implementing State action plan for rabies elimination	State, district, block,	Health Dept. Animal husbandry Dept. Department of Housing & Urban affairs Panchayat raj institutions Wildlife Dept. Waste management Dept State animal Welfare Board	
6.	Whether Joint Steering Committee for Rabies control has been established	State	Health Dept. Animal husbandry Dept.	
7.	Whether Joint Action Plan for rabies elimination has been made by the state	State	Health Dept. Animal husbandry Dept.	
	Human health			
	Mass Canine vaccination			
8.	Whether all the Reporting Formats are available for Day to day Reporting at all level	State District Block	Health Dept. Animal husbandry Dept.	
9.	Whether training programs have been Planned by the state	State	Health Dept. Animal husbandry Dept.	
10.	Whether laboratories have been identified for testing suspected rabies samples (<i>if yes please provide the list.</i>)	State	Health Dept.	
		District	Animal husbandry Dept.	

		Block		
11.	Whether IEC plans have been created for Anti Rabies campaigns	State	Health Dept. Animal husbandry Dept.	
12.	IEC prototypes (pamphlets', posters, Audio/video spots) available in Hindi /English /local language for dissemination.	State District Block	Health Dept. Animal husbandry Dept.	
13	Whether Meetings with stakeholders have been conducted (<i>if yes please provide the minutes of the meeting and proposed action plan.</i>)	State District Block	Health Dept. Animal husbandry Dept. Municipalities, Panchayat raj institutions Wildlife Dept. Waste management Dept NGOs	
15	Whether information of High risk, medium risk and low risk areas have been shared with identified stakeholders (<i>if yes please provide list of such areas.</i>)	State, District, Block,	Health Dept. Animal husbandry Dept. Municipalities, Panchayat raj institutions Wildlife Dept. Waste management Dept NGOs	
13.	Whether joint investigation Team for rabies have been formed	State District block,	Health Dept. Animal husbandry Dept.	
14.	Whether the state has planned Dog population management plan as per the ABC Act	State, district, block,	Municipality, Panchayati raj institutions, State AWBI	

Annexure 7

Facilities required for Mass dog vaccination and post vaccination survey

1. Manpower

- State program Management unit
- Veterinarians
- Trained AI technicians
- post vaccination survey staff
- Laboratory staff

2. Vaccine

- Anti-rabies vaccine

3. Logistics

- Vehicle
- Vaccine
- Communication evices
- GPS Device
- Dog Registration card
- Needle and syringe (18 gauze, 10 ml)
- Hand gloves
- Cool box with ice pack
- Marker pen (permanent)
- Cotton/tissue paper
- Sample label
- Ethanol 70

4. Diagnostics

ELISA kits for antibody titration

Annexure 8

Minimum facilities for Rabies Diagnostic Laboratories

Structural facilities

- Minimum BSL 2 laboratory facility
- Facility for conducting post mortem sample collection (separate room, cabinet, decontamination and storage)
- Incinerator for dog carcass disposal
- Waste management: Incineration, autoclaving, chemical disinfection

Manpower:

Qualified, Trained & Experienced staff

- Qualification for Laboratory officer : Post graduation in Microbiology, Pathology, , Virology, Biotechnology or related areas
- Qualification for technician : Medical/Veterinary Laboratory Technician, Post-graduation in Microbiology/Biotechnology
- Training on sample collection, laboratory diagnosis (LFA, Negri body detection, FAT/DFA, PCR)
- Pre exposure vaccination as per WHO protocol & minimum annual serum antibody titration
- Note: Regional and State level laboratories may plan for positions of one each of Laboratory Director, Quality Manager, Biosafety Officer, Technical Manager and Technician / Analyst with a view to make the laboratory compliant to ISO:IEC 17025/2017.

Laboratory Equipment infrastructure

- Bio safety Cabinets (Class II A 2 or B 2)
- Fluorescent microscopes (good quality: Carl Zeiss, Olympus, Leica, Nikon)
- Compound microscope
- Incubator (Bacteriological/BOD)
- Power back up for the laboratory: Generator, UPS
- PCR equipment's & accessories (Remarks : if molecular diagnosis is included)
- Sterilization equipment's : Autoclave, Hot air oven
- Deep freezer (-20 or -40) & refrigerator
- pH meter (optional)
- ELISA reader & accessories (Remarks: if sero monitoring by ELISA is included)
- Micro pipettes (single channel, multichannel, variable volume) & accessories

Critical consumables & accessories

- Rabies Fluorescent conjugate (Anti nucleocapsidFITC) : Biorad, Millipore make
- PBS (pH 7.2-7.4) : preferably Sigma
- Acetone (AR grade)
- Glycerol (AR grade)
- PCR consumables : RNA extraction kits, Primers etc(if molecular diagnosis is included)
- ELISA kits for antibody estimation: Quantitative ELISA kit (if sero monitoring is included)
- PPE (Personal Protective Equipment): Coveralls, goggles, gloves, face mask, apron, head cap...
- Decontamination : Sodium hypochlorite
- Other accessories: Micro slides, cover slips, petri dishes, sterile vials, dissecting instruments, coupling jars

Annexure 9

Standard Operating Procedure for Mass Dog Rabies Vaccination Campaign

Basic approaches have been described to access dogs for vaccination campaigns. Any single one or a combination of these could be used as per the needs of that region and as per the community-

- a) House-to-house visits,
- b) Fixed vaccination posts in well-recognized sites in a community,
- c) Temporary vaccination posts set up by mobile teams
- d) Mobile “street vaccination” teams
 - In Accessible rural communities: Along with continual vaccination at fixed vaccination posts in well-recognized sites within the community (e.g., government veterinary clinics).
 - In dispersed communities: Central-point vaccinations, consisting of mobile teams that set up temporary vaccination posts in central village locations. Dog handlers could be used to catch and restrain dogs humanely (The trained dog- catchers with nets).
 - In very remote communities; Combined approaches using central point and house-to-house vaccination conducted by either mobile teams of permanent staff or trained community animal health worker

Sharing information about MDV camps

Detailed vaccination schedule of the place to be visited by the teams should be prepared in advance and distributed to all the concerned in-charges who in turn informed the public so that they can bring in their pets and community dogs to the designated areas.

Plan of action

- The vaccination teams will be divided into groups and will be briefed on the schedule, location and route they would be taking.
- Local official could accompany them so that no areas were left un-covered.
- The team will be equipped with enough ARV and maintain cold chain to undertake MDV.
- Registration and permanent identification of all vaccinated dogs should be done with issuance of a card for pet animals and with owners.
- In case of free-roaming/stray dog vaccination, dog handlers could be used to catch and restrain dogs humanely as per the ABC rule and vaccinated.
- The use of color spray of all vaccinated dogs as temporary marking could be done for the stray/community owned dogs.
- A survey should be undertaken within 3 days of the campaign to assess the numbers of marked and unmarked dogs.

- ANNEXURE 10
- Standard Operating Procedure for Dog Enumeration
- The population estimate of free roaming dogs (FRD) in the area of intended interventions against rabies, such as canine mass vaccinations or animal birth control (ABC) is essential to:
 - (a) Ascertain the magnitude of intervention resources required
 - (b) Evaluate the efficacy of interventions and course correction for subsequent campaigns
- There have been various techniques used for estimating population such as Regression method (SY Fey et al 2012), Lincoln-Petersen Index and Chapman's Correction Method (Tenzen et al 2015), Beck's Method (Beck AM et al ,1973), Mark – Resight Logit Normal Method, (McClintock B et al, 2011), Closed Capture Huggin's Heterogeneity Model, (White GC, et all, 2003). The Extrapolation of dog population method is described below:-
- Calculate density of stray dog in the block= number of free roaming dogs / area of the block.
The population estimate is calculated by :-Total number of dogs counted in the sample blocks x total number of blocks /Number of sample blocks where dog enumeration is done
- However, the Population Estimation method appropriate for India should not be resource and time intensive but also feasible enough to provide an estimate for effective vaccination of 70% dog population. The probabilistic models developed on capture-recapture technique is the most feasible method adapted for the Indian context, (Tiwari et al. 2018 and Tiwari et al. 2019). The procedure using this method is detailed as follows:
 - Identify number of villages/wards/administrative units where the intervention is proposed to be applied.
 - Map the boundaries and the internal streets/roads of the village/wards/administrative units
 - Detailed street maps of the selected blocks are required to ensure that every street is covered.
 - All dogs that conform the definition of FRD must be included in the survey. A definition used by Beck (1973) for FRD must be followed by which “any unrestricted dog on a public property or any unsupervised dog on any private property” must be include in the survey.
 - The survey teams should carry writing materials, GPS and camera while on survey and the composition of the teams and the pre-determined routes followed must remain the same in the subsequent surveys.
 - The teams should record the GPS waypoints, take photographs of the FRD, and record the various characteristics of the encountered dog and its corresponding camera picture number. Care should be taken not to disturb the natural behaviour of dogs by not driving too close to the animals while still maintaining their pre-set route.
 - The teams an record the sex (male/female/not verifiable), age (pup/young/adult/old), size (small/medium/large), coat pattern (solid/bicoloured, tricoloured/mixed), primary and secondary colours of the coat, coat condition (good/average/poor), reproductive status (lactating/pregnant/oestrus), and overall health assessment (good/average/poor, presence of lameness, dermatitis or any other disability) of observed dogs
 - A minimum of two surveys should be conducted and the details should be matched to ascertain number of dogs seen once and those seen twice during the entire survey.
 - The population estimate with 95% Confidence Intervals can be obtained by using the Application Super Duplicates tool (<https://chao.shinyapps.io/SuperDuplicates/>)

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ANNEXURE 11

Reporting form for confirmed rabies in animals cases for health facility (to be fill in by Veterinary authority and submit to Medical hospital at the time of refereeing people for PEP)

Reporting Animal Health Centre:.....

Date of report:.....

Address:.....

Date of case/outbreak -

Date of report to facility -

Geographical location of outbreak village name :

Species of animal affected-

Total no. of cases-

Total no. of deaths

Probable source of outbreak/infection -

Laboratory confirmation -

Control measures undertaken -

No. of people exposed* to the infected animal (provide list separately) -

*Exposure to rabid dog bites/livestock products from rabid animal-

ANNEXURE 12

Guidance note for preventing shortage of Rabies Vaccine, Human & Anti Rabies Serum

1. Manufacturing of Rabies Vaccine, Human is a complex biological process and require a minimum of 3-4 months for manufacture and testing. Accordingly, the States/ procurement agencies may be sensitized about the minimum lead time required for supply, and plan.
2. Annual requirement of Rabies Vaccine, Human & Anti Rabies serum must be calculated 4-6 months in advance. Requirement must include 10% Wastage factor and buffer stock for three months (As Lead time from order placement to actual delivery of vaccines). Accordingly, the tender/ purchase order needs to be placed in advance.
3. As per the Drugs and Cosmetics Rules, 1945, the batch of Rabies Vaccine, Human has to be released by the manufacturer after testing in manufacturer's laboratory and after ensuring that the vaccine complies with the specifications. It is also mandatory, as per procedures defined, to submit the samples of Rabies Vaccine, Human along with protocols to Central Drugs Laboratory (CDL), Kasauli for evaluation and lot release before it is supplied in the country. Normally, testing of Rabies vaccine, Human takes approximately 3 to 4 weeks.
4. Tenders should be issued for fixed quantities rather than the rate contracts.
5. Rabies Vaccine, Human & Anti Rabies serum stock must be monitored on regular basis. Monitor the district/ institute wise stock situation and accordingly, plan the supply based on consumption. If necessary, additional procurement order may be placed.
6. The States shall analyse average time required for completing tender process to actual placement of order and accordingly, the procurement procedures to be started well in advance to avoid shortage of Rabies Vaccine, Human & Anti Rabies serum supply.
7. The State Authorities need to be sensitized to analyse their annual requirement and the lead time required for completing all procedures well in advance, in order to guard against shortages in supply of Rabies Vaccine, Human & Anti Rabies serum.
8. Anti-rabies vaccine and Anti rabies serum is part of essential drug list of National Health Mission (NHM). Budget for Rabies Vaccine, Human & Anti Rabies serum may be proposed under NHM PIP under national free drug initiative.
9. As per national guidelines, the preferred route of administration for Rabies Vaccine, Human is Intradermal. It is cost effective and requires 0.2 ml/ Visit/patient for intradermal route vs. 1 ml/visit/patient for intra muscular route).
10. In case of shortage of Rabies vaccine, Human, please inform to National Pharmaceutical Pricing Authority (NPPA), Department of Pharmaceuticals (DoP) or Ministry of Health and Family Welfare (MoHFW) for addressing the issue. Non supply of Rabies vaccine, Human due to pendency of bills should not be referred to DoP/MoHFW/CDSCO.

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ANNEXURE 15- ACTIVITY MATRIX AND ROAD MAP FOR ZERO RABIES DEATH – ANIMAL HEALTH COMPONENT

The activity of animal component such as canine vaccination and dog population management are fragmented across various sectors such as activities undertaken by ASCAD schemes, ABC activity undertaken by municipal cooperation's, animal welfare organizations. **However to achieve “Rabies: Zero”, targets the following road map describes the activities in a phase wise manner as under.**

Phase	To achieve vaccination status of atleast 70 % of the canine population	To achieve vaccination status of 70 % canine population	Maintain vaccination status of 70 % canine population	Maintain vaccination status of 70 % canine population
	Phase 1 2019, 2020, 2021	Phase 2 2022, 2023, 2024, 2025	Phase 3 2026, 2027, 2028	Phase 4 2028, 2029, 2030,
	Preparatory phase	Scale up dog vaccination	Maintain dog vaccination status	Maintain dog vaccination status and canine surveillance
Action points	<ul style="list-style-type: none"> i. Advocacy and creating awareness ii. Form a National task force on rabies. iii. Establish National Case definition for Dog rabies iv. Publish guidelines on National dog rabies programme and develop a strategy towards short terms plans and long term plans. v. Develop Legal Framework for the programme (Acts) and to make animal rabies notifiable vi. Identify or establish funding (eg schemes, program), components under funding (such as vaccines, training, IECetc). vii. Initiate Capacity building, Professional education and training of field staff viii. Achieve Intersectoral collaboration by sharing information with civic bodies and Health department. 	<ul style="list-style-type: none"> i. Advocacy and creating awareness ii. The results of pilot project in selected city or state with improvements should now be implemented throughout the country. iii. Establish surveillance systems, including feedback mechanisms, functioning and coordinated between administrative levels (national, state, district, 	<ul style="list-style-type: none"> i. Advocacy and creating awareness. x. Declare rabies free zones (villages/blocks/districts) ii. Continue Surveillance activity and canine population count. iii. Implementation of dog population management in all districts/states iv. Upgrade surveillance from canine to other animals v. Conduct joint field investigations in case of 	<ul style="list-style-type: none"> i. Declare country freedom status to OIE ii. Declare country freedom status to WHO iii. Advocacy and creating awareness iv. Verify freedom from Rabies. v. Maintain dog population management in all states

	<ul style="list-style-type: none"> x. Initiate canine Surveillance and population count and identity community owned dogs and pet dogs x. Develop the existing veterinary infrastructure (eg kennels in government clinics,). xi. Ensure Adequate supply of dog vaccines in accordance with OIE standards ii. Develop joint Outbreak response teams and other rabies control activities in areas identified as high risk areas. ii. Start aggressive campaigns for vaccination of dogs and responsible dog ownership campaign. v. Start a pilot project in selected city or state for implementation of program which would include KAP surveys. v. Develop Laboratory capacity for testing and coordinate with OIE referral laboratory and Central lab 	<p>municipal, etc.)</p> <ul style="list-style-type: none"> iv. Initiate implementation of the programme throughout the country v. evaluate vaccination coverage in canines vi. Continue Surveillance activity and canine population count vii. Implementation of dog population management viii. Strengthening Laboratory capacity and testing ix. Declare rabies free zones (villages/blocks/districts) 	<p>Human rabies cases</p> <ul style="list-style-type: none"> vi. Characterization and analysis of circulating rabies virus variants by a national or international laboratory 	
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ANNEXURE 16- ACTIVITY MATRIX AND ROAD MAP FOR ZERO RABIES DEATHS– HUMAN HEALTH COMPONENT

MOHFW has approved NRCP which is being implemented since 2012. However the road map to achieve Rabies: Zero , target the following road map describes the activities in a phase wise manner as under.

Phase				
	Phase 1 2012,2013, 2014, 2015, 2016	Phase 2 2017, 2018, 2019,2020, 2021, 2022, 2023, 2024, 2025	Phase 3 2026, 2027, 2028	Phase 4 2028, 2029, 2030,
Action points	<ul style="list-style-type: none"> i. Advocacy and creating awareness ii. Form a National task force on rabies. iii. Establish National Case definition for Human rabies iv. Publish guidelines on National rabies programme and develop a strategy towards short terms plans and long term plans. v. Develop Legal Framework for the programme (Acts) and to make human rabies notifiable vi. Identify or establish funding (eg schemes, program), components under funding (such as vaccines, training, IECetc). ii. Initiate Capacity building, Professional education and training Of medical officers and field staff ii. States implementing ID Route for Rabies PEP in major health facilities ix. Achieve Intersectoral collaboration by sharing information with civic bodies and Animal Health department. x. Initiate Human Rabies cases/ death Surveillance, animal bite cases and PEP xi. Develop the existing medical infrastructure ii. Ensure Adequate supply of ARV vaccines and ARS Serum in accordance with WHO standards 	<ul style="list-style-type: none"> i. Advocacy and creating awareness ii. Further strengthen surveillance systems, including feedback mechanisms, functioning and coordinated between administrative levels (national, state, district, municipal, etc.) for rabies cases/deaths iii. Scale up implementation of the programme throughout the country. iv. Strengthening Laboratory capacity and testing 	<ul style="list-style-type: none"> i. Advocacy and creating awareness. ii. Declare rabies free zones (villages/blocks/districts) iii. Continue Surveillance activity iv. Conduct joint field investigations in case of Human rabies cases v. All States implementing ID Route for Rabies PEP in major health facilities vi. Characterization and analysis of circulating rabies virus variants by a national or international laboratory. vii. Declare rabies free zones (villages/blocks/districts) 	<ul style="list-style-type: none"> i. Declare country freedom status to OIE ii. Declare country freedom status to WHO iii. Advocacy and creating awareness iv. Verify freedom from Rabies.

<p>ii.</p> <p>iv.</p> <p>v.</p>	<p>Develop joint Outbreak response teams and other rabies control activities in areas identified as high risk areas.</p> <p>Start aggressive campaigns for Post exposure prophylaxis, PrEP in High risk groups, and vaccination in dogs</p> <p>Develop Laboratory capacity for testing and coordinate with WHO referral laboratory</p>			
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